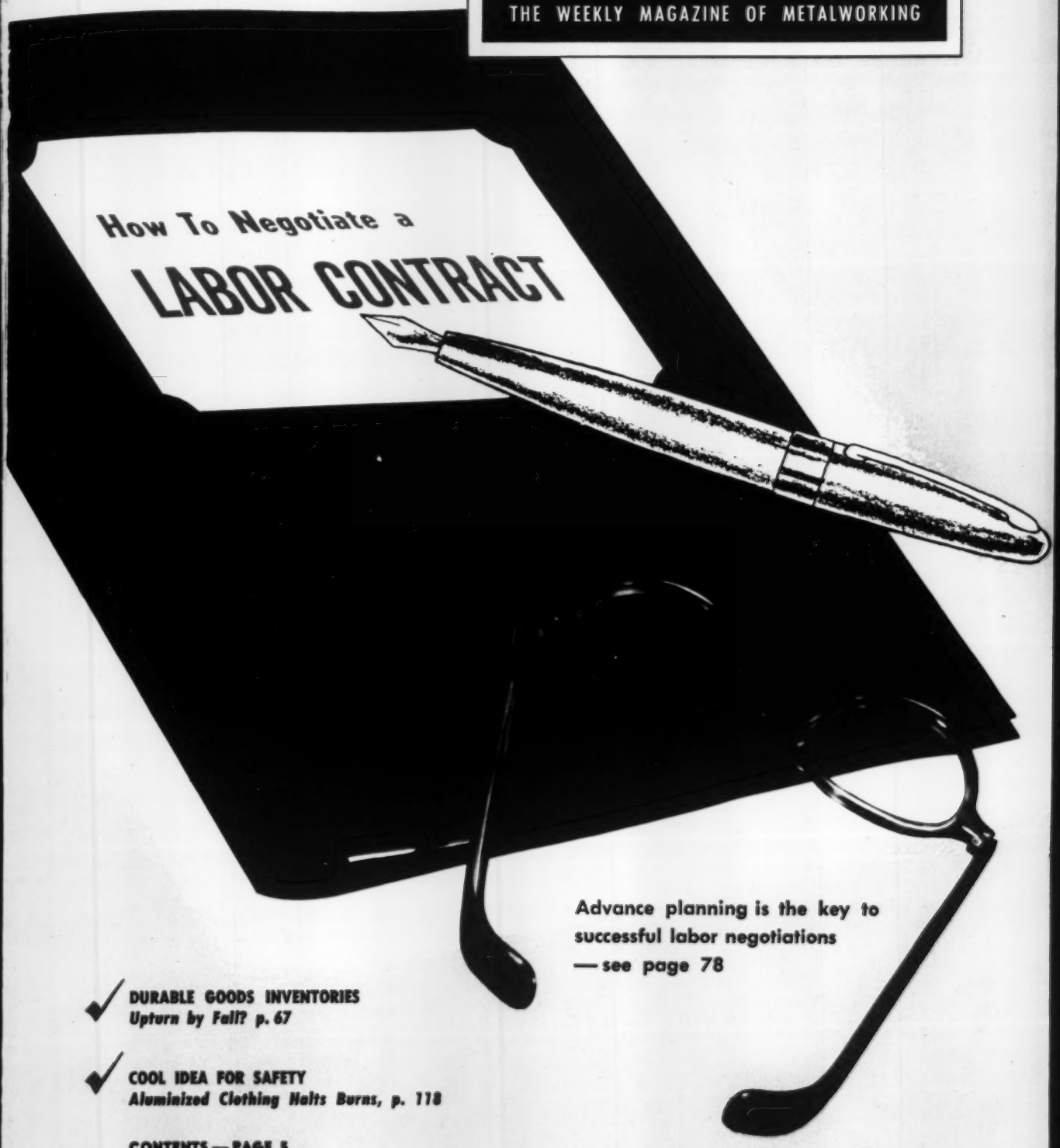
JUNE 14, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

How To Negotiate a LABOR CONTRACT



Advance planning is the key to successful labor negotiations
— see page 78

✓ **DURABLE GOODS INVENTORIES**
Upturn by Fall? p. 67

✓ **COOL IDEA FOR SAFETY**
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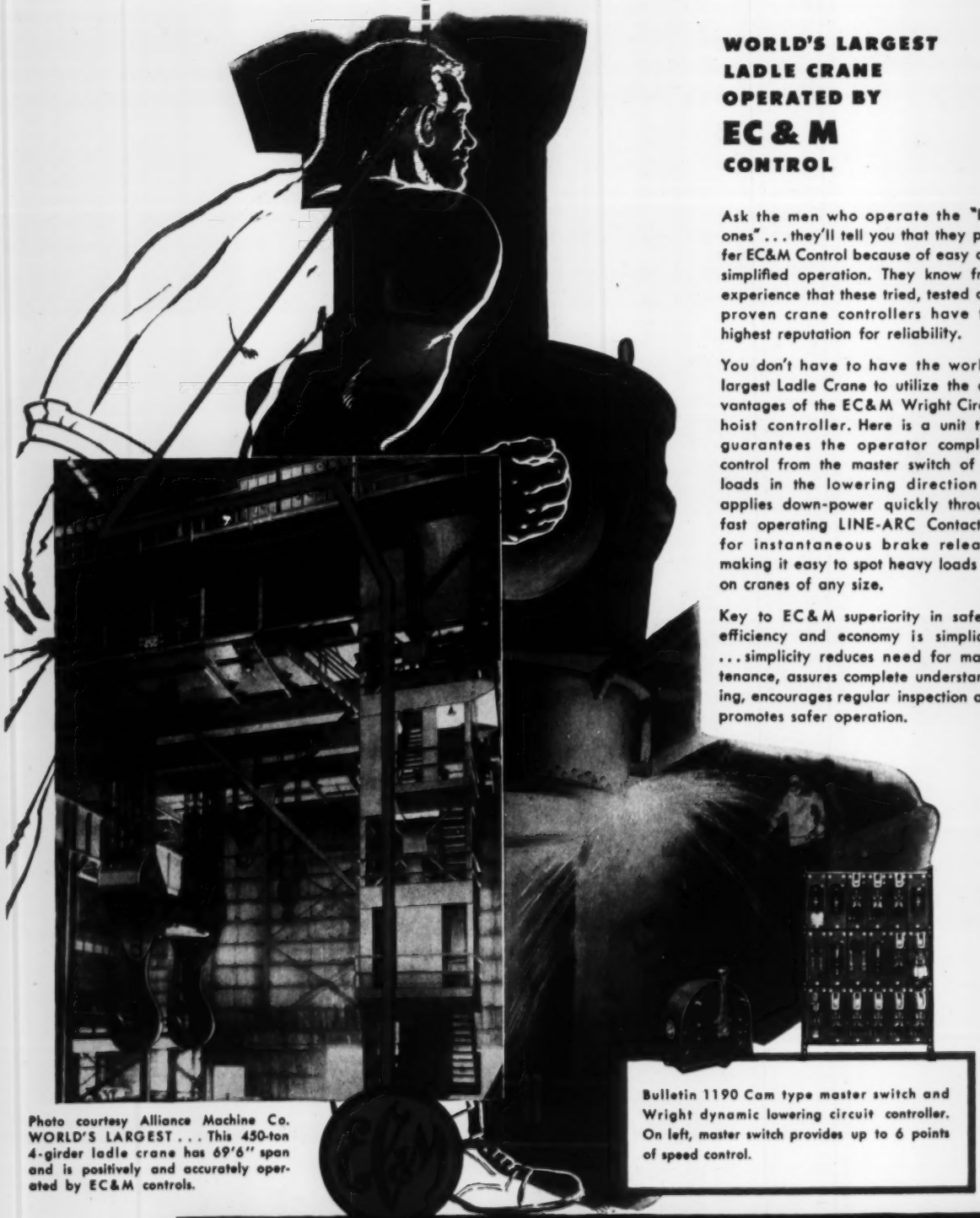
nerve center for a giant



WORLD'S LARGEST LADLE CRANE OPERATED BY EC & M CONTROL

Ask the men who operate the "big ones"... they'll tell you that they prefer EC&M Control because of easy and simplified operation. They know from experience that these tried, tested and proven crane controllers have the highest reputation for reliability.

You don't have to have the world's largest Ladle Crane to utilize the advantages of the EC&M Wright Circuit hoist controller. Here is a unit that guarantees the operator complete control from the master switch of all loads in the lowering direction... applies down-power quickly through fast operating LINE-ARC Contactors for instantaneous brake release, making it easy to spot heavy loads... on cranes of any size.

Key to EC&M superiority in safety, efficiency and economy is simplicity ... simplicity reduces need for maintenance, assures complete understanding, encourages regular inspection and promotes safer operation.

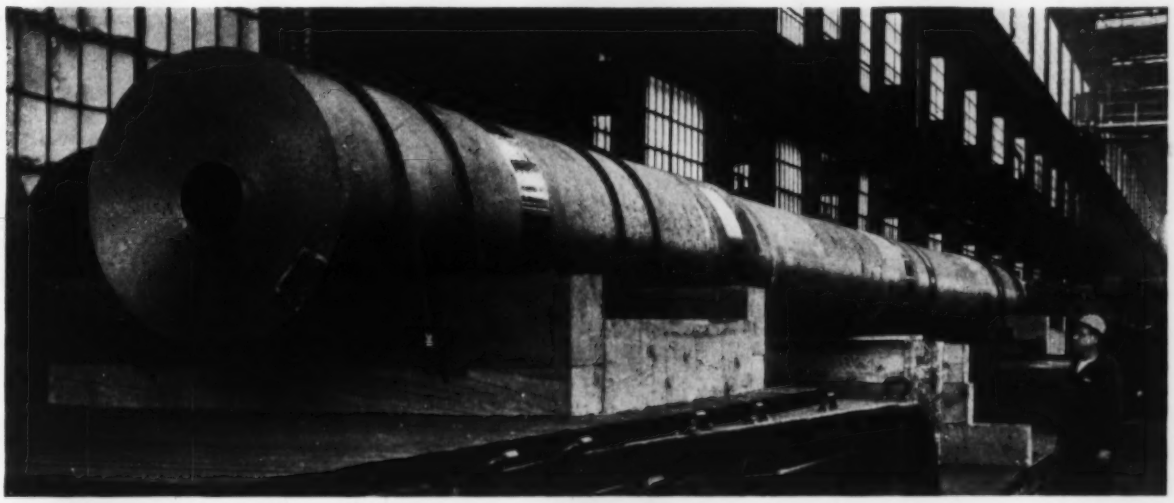
Photo courtesy Alliance Machine Co. WORLD'S LARGEST... This 450-ton 4-girder ladle crane has 69'6" span and is positively and accurately operated by EC&M controls.

Bulletin 1190 Cam type master switch and Wright dynamic lowering circuit controller. On left, master switch provides up to 6 points of speed control.

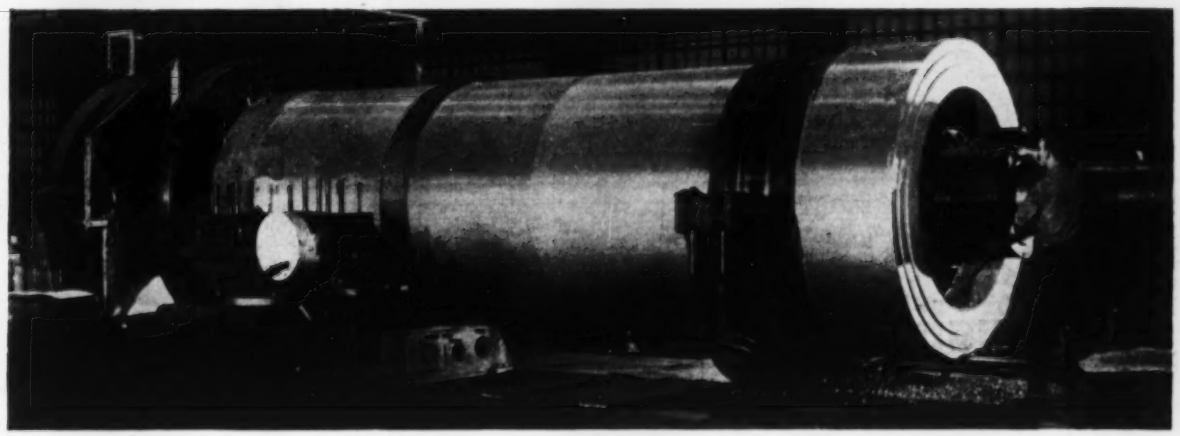
THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

1770



Big Parts for Two Big Presses



These forgings couldn't be hidden under anybody's hat; in fact, it would take a good-sized tent to cover them. The long column on the freight car, part of a 35,000-ton forging press, weighs 94 tons. The husky cylinder is for a smaller press, but even so, it will weigh 88 tons after machining and will have an OD of approximately 7 ft at the largest point.

The two forgings are giants by any standards. Bethlehem turns out plenty of big ones—some even larger than these. But don't forget, our shops are always glad to handle the smaller jobs, too—pieces weighing only a few tons, a few pounds, or a few ounces. We mentioned hiding under a hat. A great many Bethlehem forgings could easily be covered by a hat, and not a very large one at that. For instance, we've made millions of small drop forgings and are making more all the time.

The point is, Bethlehem is equipped to produce the *full* range of forgings—everything from the midget class to the heavyweights of 100 tons and more. So don't think of us in terms of any one size-group. Whenever you're planning forgings . . . large, small, or medium . . . phone or write our nearest office. We'll do the job you have in mind and do it right!

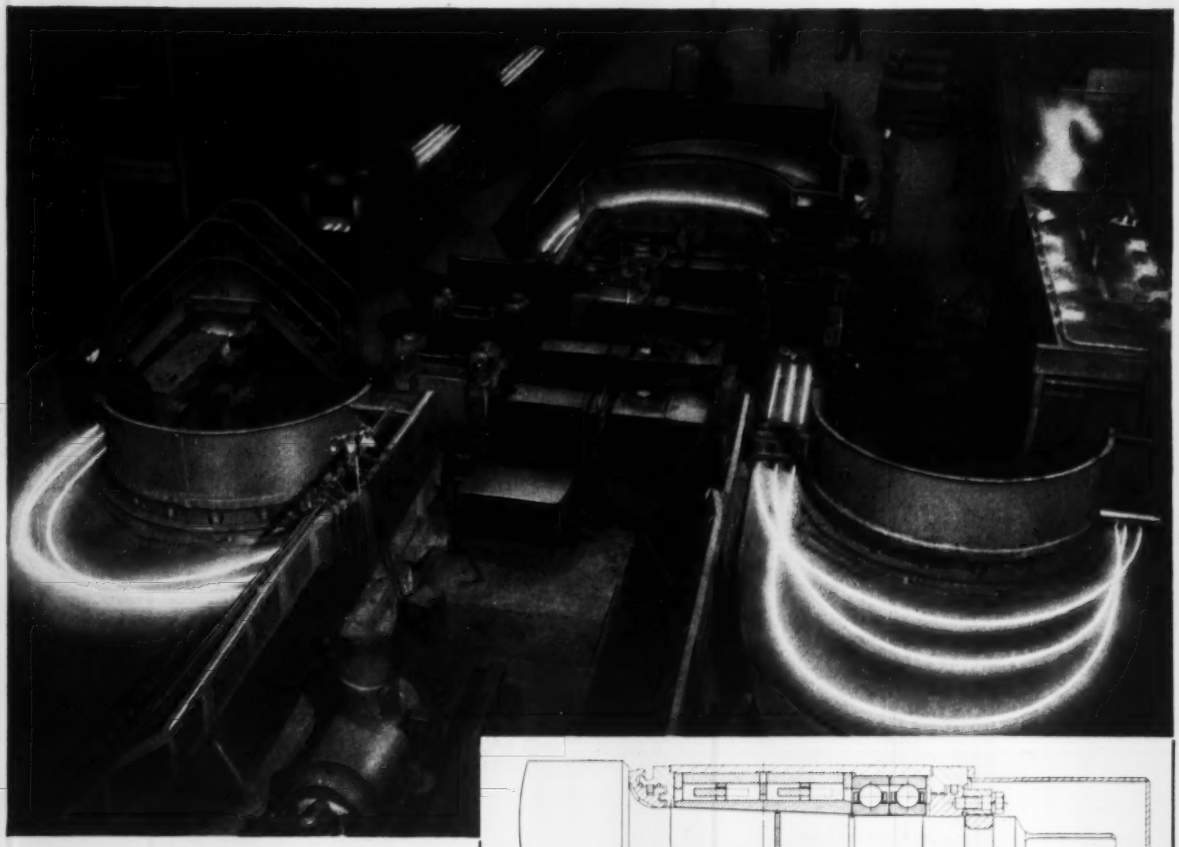
On the Small Side

This 1½-lb drop forging is as typical of Bethlehem production as the huge pieces weighing many tons.

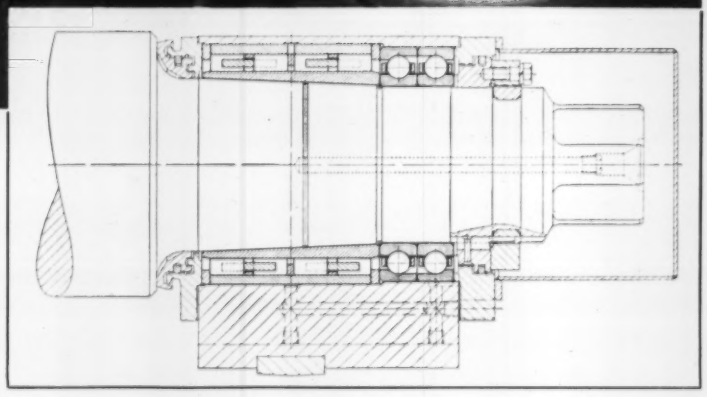
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor*, Bethlehem Steel Export Corporation

BETHLEHEM STEEL



top quality rod
at better than
50 miles per hour



SKF Roll Neck as installed in United's Rendleman Mill at Jones & Laughlin. Dotted lines show oil passages for quick, easy bearing removal by the SKF-pioneered Hydraulic Removal System.

SKF multi-row cylindrical bearings installed on the roll necks of the Jones & Laughlin Rendleman rod mill by United Engineering and Foundry Company, are doing an outstanding job at mill speeds of 4700 feet per minute.

The SKF multi-row cylindrical bearing was specifically designed for roll neck applications. This four row grease lubricated bearing incorporates all those necessary qualities for the highest standards of roll neck bearing performance long desired by mill builders.

This is another example of SKF leadership in the rolling mill field. Consult SKF and have *them* help *you* "put the right bearing in the right place."

SKF INDUSTRIES, INC., Philadelphia 32, Pa.—*manufacturers of* SKF *and* HESS-BRIGHT® *bearings.*

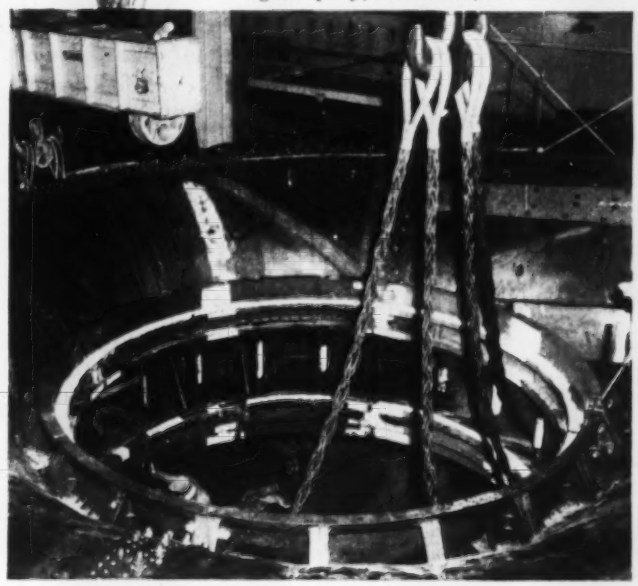
7401

SKF®

BALL AND ROLLER BEARINGS

Hookers-On handle loads faster with these slings

115-ton casing assembly handled with three cranes and two pairs of Macwhyte ATLAS type 1 Round-Braided Slings.
Photo courtesy Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin



ATLAS Slings are flexible, lightweight, and easy to handle

Safety, economy, and long service life are the results of the exclusive Macwhyte ATLAS balanced-braided construction. All ropes in ATLAS Slings are braided in a continuous uniform spiral path. Ropes are endless—all ropes in the body are the same length and carry an equal share of the load. There are two pairs of Left Lay and two pairs of Right Lay ropes, making eight ropes in all in the equally balanced-braided ATLAS Sling body.

Macwhyte ATLAS braided wire rope slings last longer because they do not kink, snarl, or curl up as easily as ordinary slings.

All Macwhyte ATLAS Slings are custom-made in the size and type you need for the best load handling. In addition to ATLAS Slings, Macwhyte Company manufactures Drew Flat-Braided Slings and Monarch Single-Part Slings.

MACWHYTE SLINGS

Macwhyte engineers will recommend the proper sling for best service. For information or specifications on Macwhyte ATLAS, Drew, and Monarch Slings, ask any Macwhyte distributor or write direct to:

MACWHYTE COMPANY • *2912 Fourteenth Ave., Kenosha, Wis.*

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies.

Mill Depots: New York • Pittsburgh • Chicago • St. Paul Ft. Worth • Portland • Seattle • San Francisco • Los Angeles.

Ask for Bulletin 5308 containing load ratings, strengths and specifications

Type 1 Macwhyte ATLAS Round-Braided Sling →

HERE'S PROOF FROM REO MOTORS—

Now you can BELT assembly lines in spite of oil and grease

ORDINARY conveyor belts failed on the lawnmower motor assembly line of Reo Motors, Incorporated, in twelve weeks' service or less because of oil and kerosene that attacked the belts—caused swelling, flaking off and separation of covers.

The G.T.M.—Goodyear Technical Man—specified CHEMIGUM belts—designed and made to cope with excessively oily conditions. Now after being in service *over six times* longer than any previous belt—and still in tiptop shape—Reo writes:

"We installed one of your belts on our engine assembly line. Now, two years and scores of thousands of engines later, it shows very few signs of wear. The remarkable resistance to oil saturation and its ability to withstand constant punishment sold us on installing a second CHEMIGUM *belt on another of our assembly lines. Here again we have been well satisfied."*

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GTR-Specified

CONSTRUCTIONS

A GREAT RECORD in 1951 —even greater TODAY

Three years ago this amazing conveyor belt had outlasted all previously used belts by better than six to one. TODAY it's still on the job — still working — after more than *15 times* the service.

Packaged or bagged materials on inclines

The G.T.M. can choose a belt construction for you that will best meet the exact demands of load and operating conditions found in your plant—to give you the longest possible conveyor service at lowest cost in the long run. You can talk it over with him by calling your nearest Goodyear Distributor, or writing Goodyear, Akron 16, Ohio.

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING, RUBBER-COVERED ROLLS built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 24 June 14, 1954

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1 SAVE INITIAL COST!
Superior production capacity and know-how means **lower costs** from Anti-Corrosive, America's oldest and largest firm dealing **exclusively** in stainless steel fastenings!

2 SAVE TIME!
IN STOCK inventory of more than 9,000 varieties and sizes of stainless fastenings means **immediate delivery** of your needs! Streamlined service on special orders, too!

3 SAVE OPERATING COSTS!
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Write for FREE Catalog 54C, the **one complete reference handbook** to stainless steel fastenings! Varieties, sizes, prices and discounts **at a glance!**

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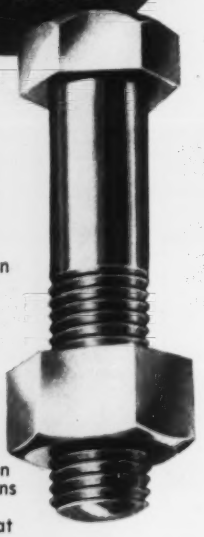
ANTI-CORROSIVE METAL PRODUCTS CO., INC.

Castleton-on-Hudson New York

Uniform
Class 3 Fit
BOLTS
NUTS
STUDS



TITANIUM

- Carbon Steel
- Alloy Steels
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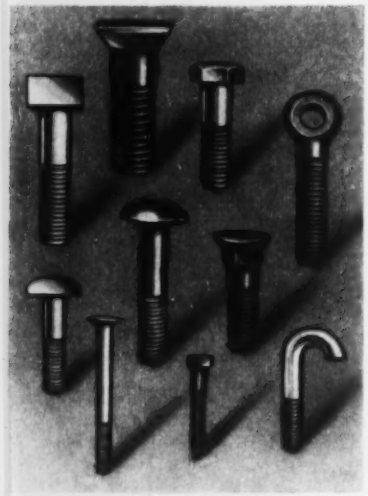
- Silicon Bronze
- Naval Brass
- Monel Metal

You can depend on a uniform Class 3 fit if required when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.



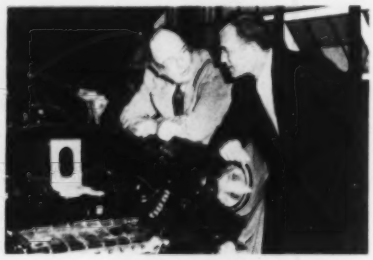
BETTER BOLTS SINCE 1882

PAWTUCKET
MANUFACTURING COMPANY
327 Pine St. • Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.
"The Bolt Man"

behind the scenes

Power of the Press

"Stop the assembly line! STEEL wants to take a picture." Crazy as it sounds, that's exactly what happened and here's the photo to prove it.



That's John P. Mansfield, president of the Plymouth Division of the Chrysler Corp., being interviewed by Floyd Lawrence, author of STEEL's weekly "Mirrors of Motordom" column.

Floyd wanted a shot of the Plymouth assembly line for a special project we are working on back here at the paper mill. He had no idea he was making history when he asked Mr. Mansfield to "watch the birdie" with him. Why? Because to get the shot Lawrence wanted, Mr. Mansfield ordered the assembly line halted for a full 30 seconds . . . a favor unprecedented in newspaper and magazine reporting history.

Editorial Achievement

I've started this bit about four times now. Each time I get to the end of the first paragraph, I reread what I have written, snatch the paper from the typewriter and start anew.

My first attempt was too braggadocio; the second too modest; the third too casual; the fourth . . . blah!

Actually, all I'm trying to do is tell you good folks that STEEL has once again been singled out for special honors in the Annual Business Paper Editorial Achievement Competitions.

The competitions were held last month with more than 475 publications submitting entries.

Fact is, the announcement caused hardly a stir up on "number 9" where our pen and pencil boys hold sway. Could be they are growing used to this business of receiving awards . . . they've garnered a total of 16 in the past 10 years.

The real reason for their seeming lack of enthusiasm is something entirely different, however. They aren't doing nip-ups and cart wheels merely because they know that any special honors they attract with their editorial efforts are merely by-products of their A-1 consideration: that of supplying you with the kind of material you need in order to do a better job of producing and then selling your products.

STEEL's awards this year were: (1) First Award in the Industrial Division for the "1953 Program for Management" articles; (2) Certificate of Merit in the Industrial Division for the "Machine Tool Buyers' Guide."

Merle Kingman, managing editor of *Industrial Marketing*, who sponsored the competitions, sent the following comments to Irwin Such, STEEL Editor . . .

"May I congratulate you on winning this 'highest award in business publication journalism', on behalf of the group of 24 distinguished judges . . . you have achieved a real distinction in winning an award in a field of some 475 entries of outstanding quality."

We are pleased with Mr. Kingman's very nice letter. We're not nearly as pleased with it as we were with the 500 or so letters we received from you telling us how useful you found our Program for Management articles.

Goodies for You

Just so you'll know which of our editors did that super job on Program for Management article No. 4 —"Stabilizing Production and Employment" (May 17 issue) you can direct all bouquets to Floyd Lawrence, Detroit editor.

Incidentally, only a month remains before you will be receiving your *Guide for Steel Buyers*. July 12 is the publication date. Best be watching for it so that no one runs off with your copy.

Shrdlu

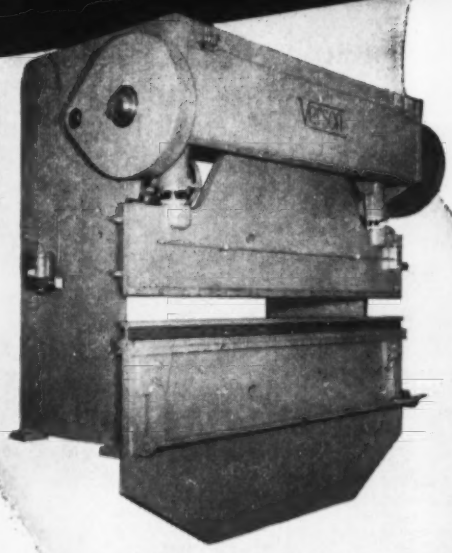
(Metalworking Outlook—Page 59)

If you form, bend, or punch metal . . .

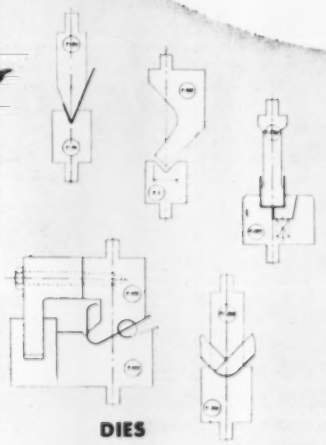
Take Advantage of the complete

TRADE Verson MARK

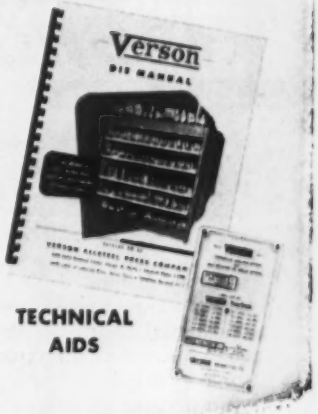
PRESS BRAKE AND DIE SERVICE



PRESS BRAKES



DIES



TECHNICAL AIDS

Whatever your requirements in press brakes and press brake dies, it will pay you to have full information on Verson's complete service available at all times. Check this list and write for the data you can use:

PRESS BRAKES—The Verson line includes both mechanical and hydraulic models ranging from the 16-48 which will bend 48" of 16 ga. mild steel up to the largest ever built. Included in the line are two standard models available from stock. Catalog B-51 which gives full specifications is available on request.

PRESS BRAKE DIES—The Verson line ranges from the simplest Vee bend dies to the most intricate progressive dies and punching attachments. Over 200 of the most common die sets are illustrated in the Verson Die Manual which is available on request.

TECHNICAL AIDS—Verson technical aids include the 112 page Die Manual which in addition to illustrating typical dies gives much selection and application data available nowhere else. Augmenting the manual is a handy pocket size tonnage calculator which quickly tells the tonnage required for making any bend. Copies of both of these aids can be had by request on your company letterhead.

A Verson Press for every job from 60 tons up.

TRADE Verson MARK

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • SO. LAMAR AT LEDBETTER DRIVE, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

you can
SAVE TIME
and
MONEY
on
jobs like this
with
the

...GISHOLT SPEED SELECTOR!

HERE'S WHY:

No manual gear shifting! You simply turn this hand wheel or touch a trip lever (for Direct or Pre-set operation). Shifting is automatic—by hydraulic power—while the operator positions the new tools for the next cut.

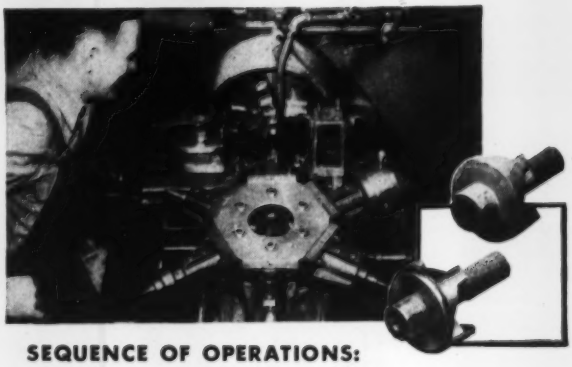
It's all so much simpler with the Speed Selector. There's no need for time-wasting computations, no mental effort, no physical effort. With simple controls, either direct or prearranged, the operator gets the ideal f.p.m. cutting speed for each cut. And it's *much faster,* of course!

The Speed Selector is standard on Gisholt Nos. 4 and 5 Ram Type Turret Lathes and on all Gisholt Saddle Type Lathes.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

HERE'S HOW:



SEQUENCE OF OPERATIONS:

Note the star which indicates each time the Speed Selector is used.

★ **1. Hexagon turret—Center drill at 297 r.p.m. hand feed**

2. Hexagon turret—Support with live center

★ **3. Square turret—Rough turn and face at 96 r.p.m., .003 feed**

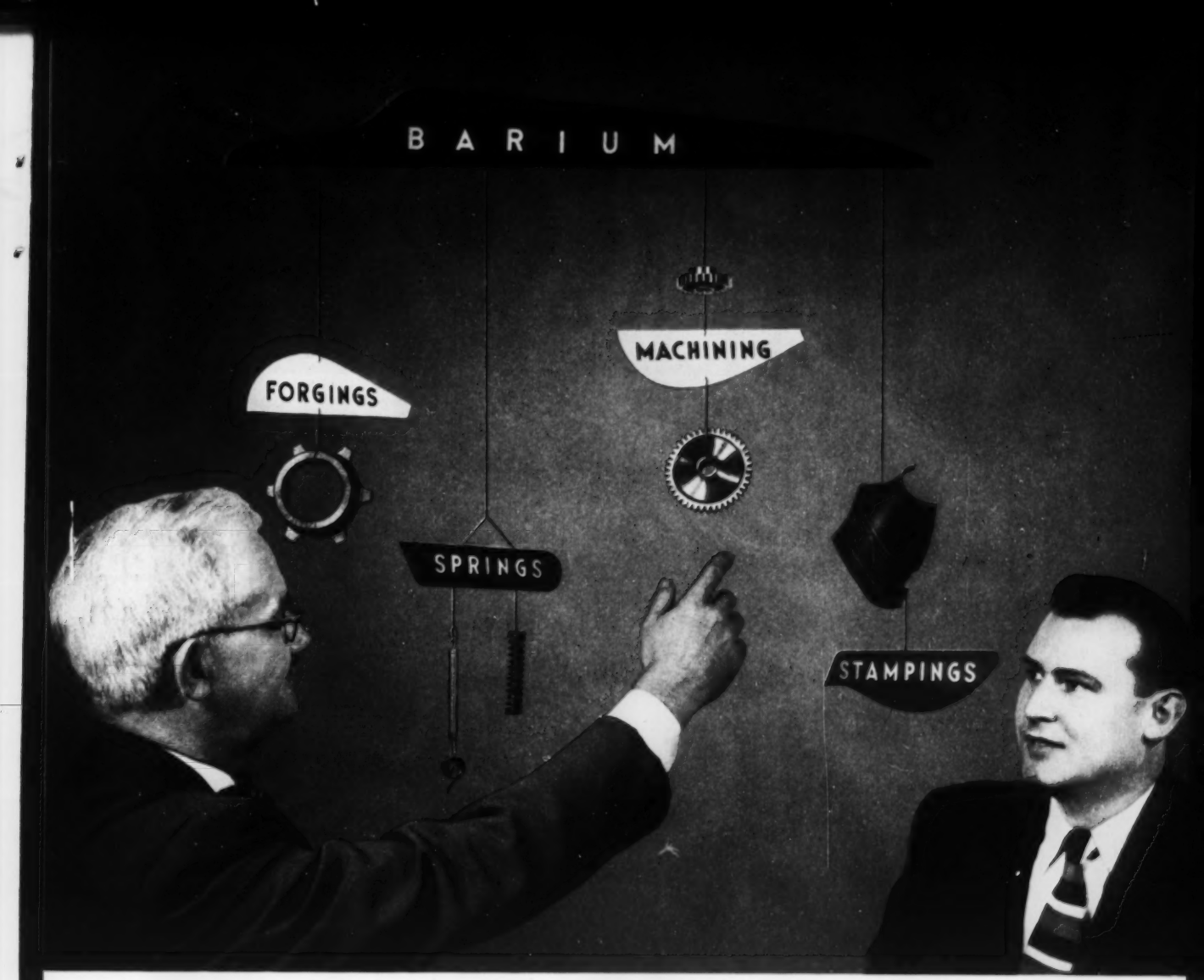
★ **4. Square turret—Finish turn, face and chamfer at 126 r.p.m. .002 feed**

★ **5. Hexagon turret—Start and drill through at 226 r.p.m., .003 feed. Trip the Hi-Lo lever, eliminating even the need for turning the hand wheel**

★ **6. Hexagon turret—Thread with tap at 39 r.p.m., leaders and followers**

—and you're ready for a new workpiece

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES



Get FOUR basics from a single source on the double

If you're one of the thousands of manufacturers who use forgings, stampings, springs or machinings, here's a tip:

Barium is one of the few organizations (frankly, we can't think of another) that gives you the opportunity to buy *any or all* of these basics from just *one source*. By the piece or assembled, whichever way you need them. We can do this because we've got *separate companies* devoting their time and talent to each of these operations — not just divisions or departments.

We don't stop there. If you like, your product can receive the free benefit of Barium's "focused engineering". This unique service concentrates on your problem some of the most advanced engineering thinking being done today in an unequalled variety of fields. Whether you need a bridge girder or an airplane engine, Barium's the place to come for it. That's why dealing with Barium takes a load off your shoulders as well as your desk.

Remember — to Barium your *entire* order is important. No danger of any component being delayed — Barium keeps sharp watch on all processing. This means faster handling, less paperwork, and pinpointed responsibility. Write for "The Barium Story" — it tells all. BARIUM STEEL CORPORATION, 25 Broad St., New York City 4.

16 INTEGRATED COMPANIES

BARIUM

STEEL CORPORATION

WORKING IN STEEL, ALUMINUM, MAGNESIUM, FIBERGLASS

4.1

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. • WILEY MANUFACTURING CO.

FIRE!

PUT IT OUT IN SECONDS
with a Kidde Portable extinguisher

Unless you get the jump on fire the minute it starts, you stand a good chance of kissing your business good-bye.

That's why it's so important to have a Kidde portable extinguisher near *every* fire hazard in your plant.

Protect motors, electrical equipment, flammable liquids and machinery with Kidde portables. Then, when fire strikes, you're ready for it.

Just grab a Kidde CO_2 or dry chemical portable, aim the horn, pull the trigger, and—Whoosh! No more fire!

Your *next* fire could be your *last* . . . Contact Kidde today!

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Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

LETTERS
TO THE EDITORS

Aids in Search for Markets

Your "Behind the Scenes" column for May 17 (p. 6) indicates a 24-page digest of a market research study by STEEL, "U. S. Analysis of Metalworking," and a wall map outlining the market areas by county can be obtained upon request.

We would appreciate it very much if we could obtain this information.

R. M. Rex
president & general manager
Columbus Bolt & Forging Co.
Columbus, O.

I would like very much to have a copy of the wall map as well as the 24-page digest. I would also like to see the complete study, "Metalworking Markets in the U. S.," and would appreciate having one of STEEL's representatives call in the near future.

E. Wright Yount
vice president—sales
American Metal Products Co.
Detroit

I would appreciate a copy of each . . .

A. J. Audet
Wickwire Spencer Steel Division
Colorado Fuel & Iron Corp.
Buffalo

Please send the two items to my attention . . .

James R. Cumming
Stamco Inc.
New Bremen, O.

• *These are being sent. Copies of both the 24-page digest and the 4-color wall map are still available. The complete study will gladly be shown by one of* STEEL*'s regional representatives upon request to our Cleveland office.—ED.*

Problem of Protective Coating

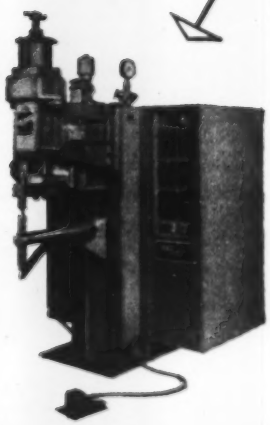
We are seeking a protective finish or coating which can be applied easily on both stainless steel and cold-rolled carbon steel (regular finishes of steel as well as luster surfaces or high-polished finishes). We wish to eliminate scratch marks made by the dies. The coating, however, must not deter from the drawability of the steel and must have easy removability when the part is fabricated.

Do you have any comments as to possible sources of supply?

C. C. Fletcher
Worcester Pressed Steel Co.
Worcester, Mass.

• *Several companies are now selling strippable plastic finishes for stainless steel to protect finish during heating, drawing, stamping and allied operations. We suggest you contact the Society of Plastics Industry Inc., 67 W. 44th St.,*

(Please turn to page 12)



Two Standard Sciaky Three-Phase Welders Join 42 Parts in Over 1,000 Assemblies per Day

COMPLEX simulated wire wheels for automobiles are mass produced at Casco Products in Bridgeport, Conn. Only two standard Sciaky patented Three-Phase welders adapted with multiple gun tooling are used. No skilled workers are required to join 40 spokes of .430 stainless steel to the two retainer rings in only four operations.

Standard Sciaky welders eliminated cost of expensive special machines. Sciaky Three-Phase suited Casco's limited power facilities, where conventional single phase could not. Sciaky Three-Phase consistency of operation satisfied rigid inspection of alignment and set-down of welds to insure positive fit, and provided smooth fillet welds eliminating special finishing. For complete details, write for R.W.A.W. Vol. 3, No. 9.

Resistance welding of Casco wire wheels is another fine example of Sciaky's basic thinking—welders designed for *more useful work* at *lowest operating cost* with *maximum reliability.*

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

4909 West 67th Street, Chicago 38, Illinois

FOR SPECIAL REAMERS . . . REMEMBER

GORHAM

They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

Actually, these reamers represent just a few of the many special-purpose cutting tools produced by Gorham. Others include milling cutters and end mills, inserted blade cutters, flat and circular form tools, profile cutters, and carbide tipped tools of every description. Gorham "specials" are turning problems into profits in thousands of plants every day . . . and the one we engineer for you will solve *your* next production machining problem, too! Take advantage of our experience.

Your nearby Gorham Field Engineer is a qualified cutting tool expert in both practical design and actual application, and his assistance is yours without obligation. Just write for his name, or send details of your problem direct to us. We'll have him get in touch with you promptly.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

(Concluded from page 10)

New York 36, for a list of the manufacturers.—ED.

Prefabs: Expanding Market

I think that you did an excellent job on your story, "Prefabricated Houses: More Sales for Metalworking" (May 24, p. 55). We would like to reprint your story in *PF—The Magazine of Prefabrication.* Also we'd like your permission to reprint about 100 copies of the article for H. H. Steidle, PHMI manager.

Harry H. Cutler
assistant manager
Prefabricated Home Manufacturers' Institute
Washington

• *Permission granted.—ED.*

In your May 24 story on prefabricated homes you mention the Prefabricated Home Manufacturers' Institute. As we are interested in obtaining more information on prefabricated homes, would you kindly mail us the address of this institute.

Charles E. Crouch
treasurer
J. R. Richards Co.
Carnegie, Pa.

• *It's Prefabricated Home Manufacturers' Institute, 908 20th St. N.W., Washington 6.—ED.*

Told the Whole Story

You are to be complimented on the series of articles on leasing and renting (Mar. 29, Apr. 5, and Apr. 12). The series is timely and undoubtedly has received close attention by the majority of your readers.

Many of our customers have requested literature concerning the leasing of equipment. Since the appearance of your series, I have referred many people to it. I would like to be in a position to hand out a reprint of this series of articles to these customers that request leasing information.

If it is possible, please send me about 100 copies. Let me again compliment you on the completeness of this series.

Robert F. LaBarr
Warner & Swasey Co.
Cleveland

Inquiry with Special Interest

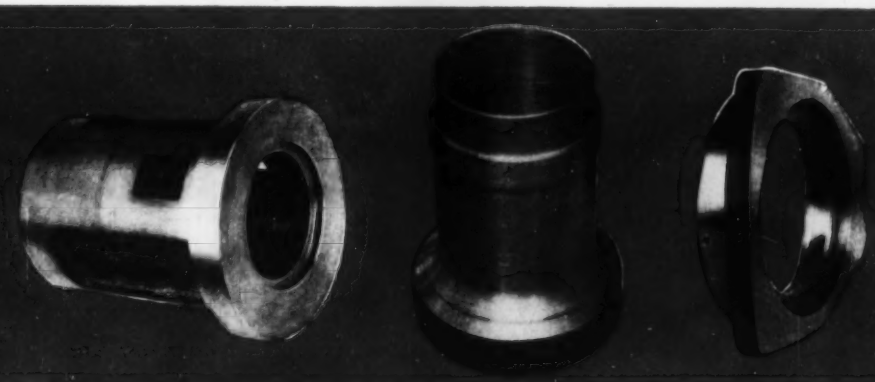
In your story, "Fastening Costs Take a Nose Dive" (April 12, p. 100), there is reference to the Crockatt Engineering Co., San Francisco, in connection with a specially designed punch and die set.

This equipment may be of further interest to us, and we would therefore like to get the full address of Crockatt Engineering Co.

D. E. Merriman
purchasing agent
Stanley Works
New Britain, Conn.

• *It's Crockatt Engineering Co., 1142-3 Phelan Bldg., San Francisco 2.—ED.*

big production jumps such as these actual jobs...



	FINGER HOLDER BODY 6⅝" dia. Semi-steel	SEMI-FINISHED COLLET 5⅞" dia. 4160 steel	BEARING RETAINER 9¼" dia. Lumen alloy
Former Method	39. 2 minutes	65 minutes	17.3 minutes
Model MC Time	11.2 minutes	13 minutes	6.0 minutes

can be made ONLY on the brand new

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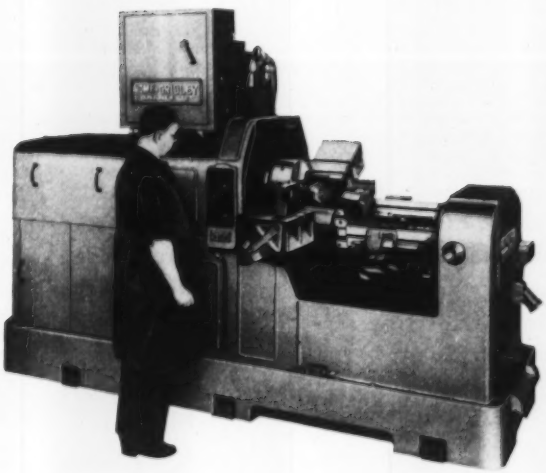
MODEL MC ACME-GRIDLEY

Single Spindle Automatic Chuckers



General claims about this or any other new model machine can be facts BUT every experienced shop executive knows that only a comparison of specific net gains of new methods over old can justify his serious investigation.

For this reason we emphasize the unprecedented production gains on 3 chucking jobs, typical of the kind of time savings realized since we announced the new Acme-Gridley 12" Universal Single Spindle Chucker a year ago.

If you believe that similar facts on your particular chucking problems are worth your making such a comparison and if you are willing to be surprised by similar gains, guaranteed, your next move is to call in our engineers. General bulletin MC53 tells all about the design advantages.

You can't do TODAY'S job with YESTERDAY'S tools— and be in business TOMORROW.

The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

Yes, from the Brooklyn Bridge to the Golden Gate, your only source for time-saving, money-saving Morse *Electrolized* Drills, Taps, Reamers, Cutters and End Mills is your nearest Morse-Franchised Distributor.

Certified test-reports prove that... on jobs where there's excessive wear, abrasion and corrosion... *Morse Electrolized Tools last 2 to 10 times longer than untreated tools.*

And that's why, on any tough job you have now... or on *any* job, tough or not, where you can profit by this extra tool life and performance... it pays to consult your Morse-Franchised Distributor on the application of Morse *Electrolized* Tools to your own particular needs. He has the practical knowledge... and he's backed by the top line and the top engineering service of the cutting tool industry.

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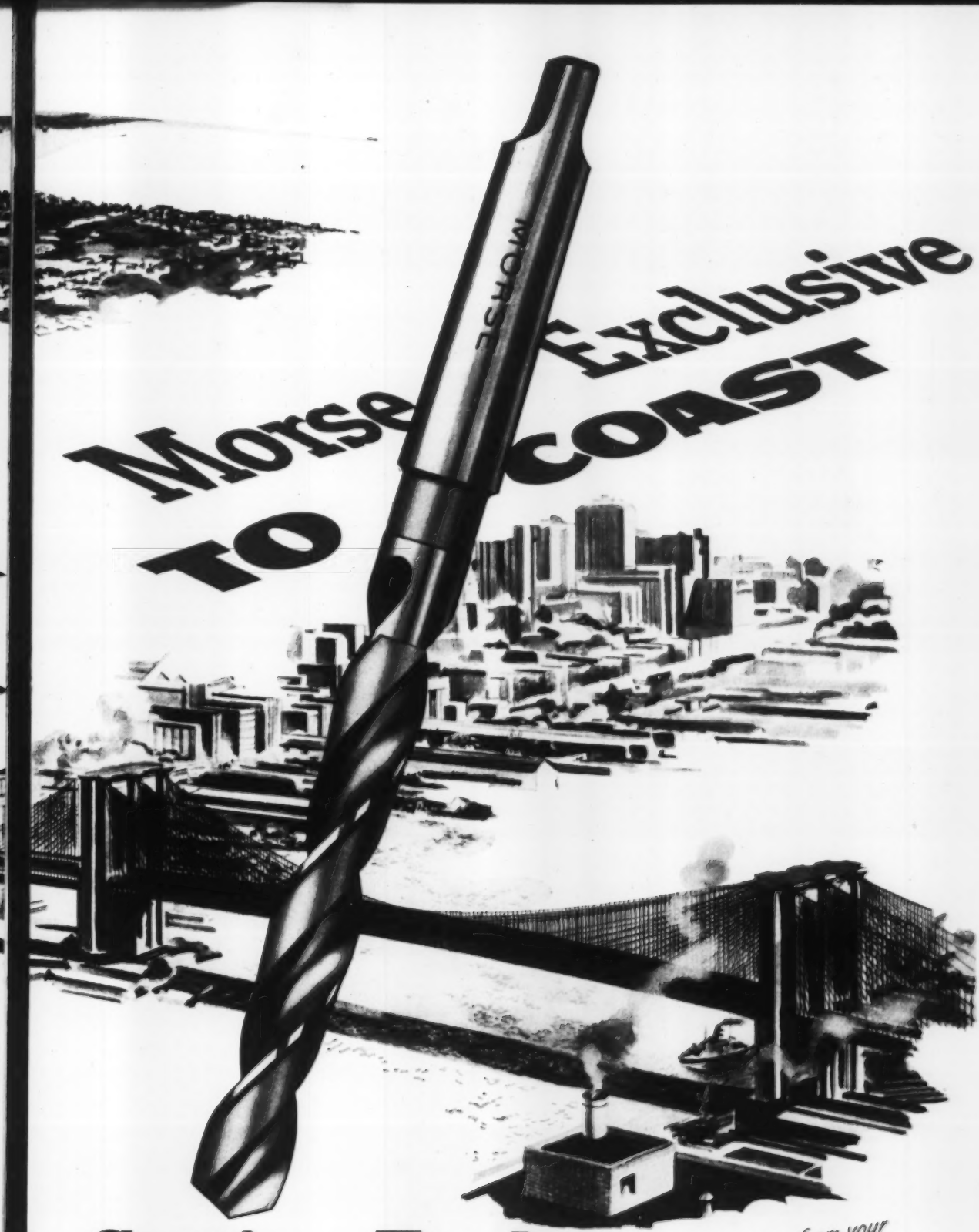

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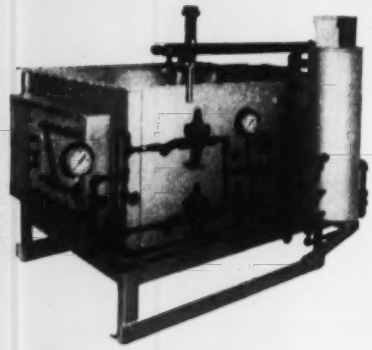

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Cracking Chambers

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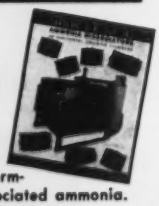

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10 advantages of dissociated ammonia over all other controlled atmospheres you have used.

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Specifications for standard S&W Dissociators with rated C.F.H. output from 75 to 2000. Larger capacities available on request.

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Electric and Fuel-Fired Furnaces

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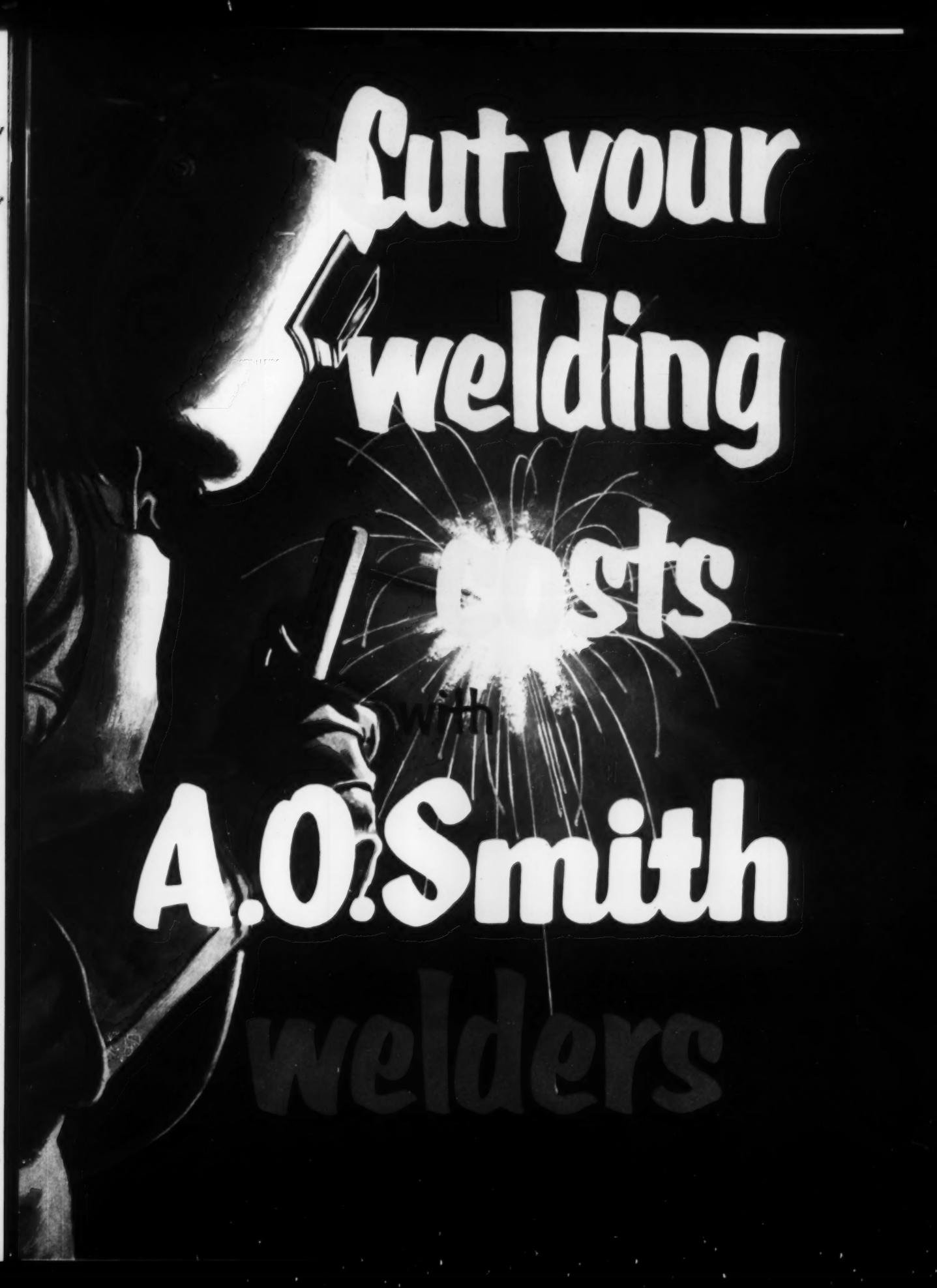
Cut your
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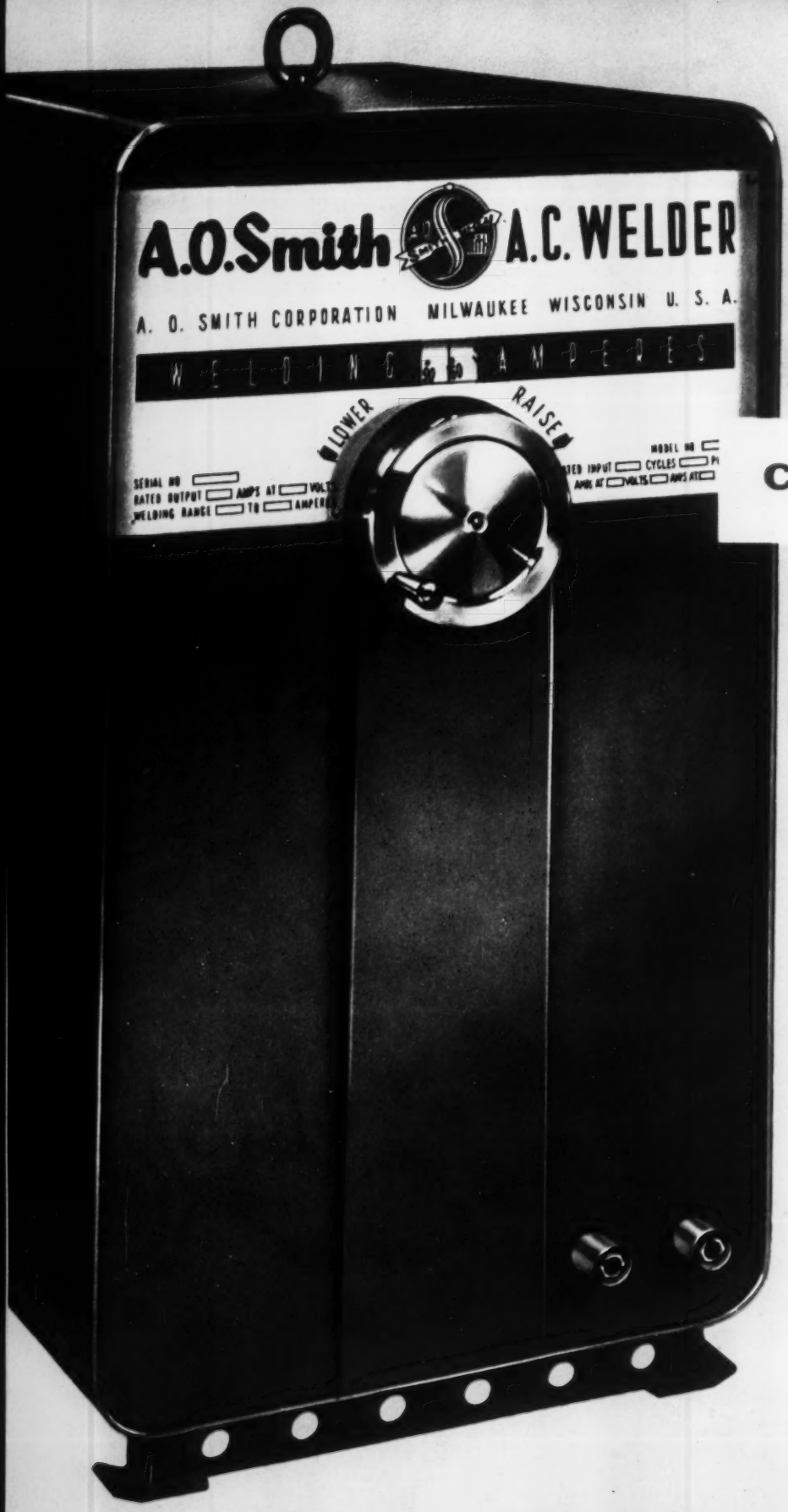
costs
with
A.O.Smith
welders



...and get all the

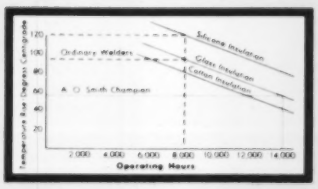
A. C. CHAMPION

heavy-duty welder

Designed and long proved the most dependable power source for continuous operation on the most demanding welding assignments at full rated output.

The CHAMPION has enough copper, plus downdraft ventilation, to assure no more than a 55° C. temperature rise when operating at full rated output. This means almost twice the operating life of any comparable heavy-duty welder!

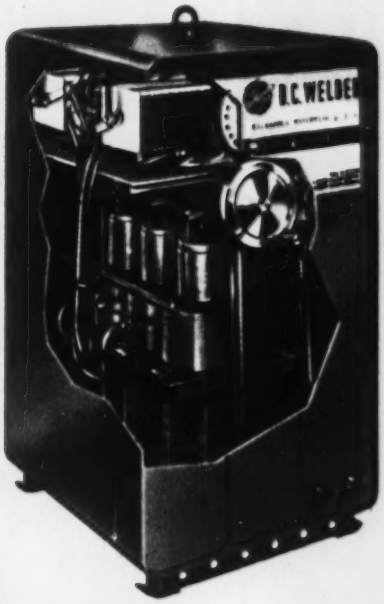
75 open circuit volts for high-speed welding with a faster and smoother arc! You can "drag the arc" on rapid work and weld low-hydrogen electrodes without "pop-outs." All-weather case makes it as useful outside as in the shop. Available in 300-, 400- and 500-amp models.



The A. C. UTILITY for farms, garages, machine shops with dual welding range: 25-90 amps., 35-180 amps

extra benefits

which A. O. Smith design and engineering provide!

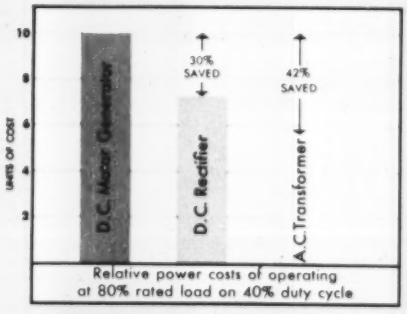


D. C.
RECTIFIER
heavy-duty welder

Here is a complete line of N.E.M.A.-rated welding power sources that operate without a single, heavy, rotating part! No motor (other than ventilating fan) and no generator . . . nothing to wear, no commutators to corrode or turn down, no bearings or brushes to replace! Yet they provide a better welding current for all types of work, and operate with unmatched efficiency!

SAVE POWER

Power costs of operating 400-amp. welders are charted below, providing an opportunity to compare motor-generator, rectifier, and AC transformer demands on 40% duty cycle.



Relative power costs of operating at 80% rated load on 40% duty cycle

The savings in power effected by transformer type machines over motor generators result from the improved efficiency under load of the A. C. transformer (85% to 88%) and the D. C. Rectifier (69% to 72%) over the D. C. Motor Generator (45% to 50%), plus the ability of transformer and rectifier to deliver full welding current instantly, when demanded, without requiring large idle-time power to keep rotating parts in motion. The savings are real. In fact, many manufacturers have found that a new transformer will practically pay for itself in a year! Ask your A. O. Smith distributor or representative to show you how, at your next opportunity.

SAVE OTHER COSTS

You save more than power costs when M.G. sets are replaced by A. O. Smith welding machines. Rectifier and transformer welding current inherently has less arc blow, and that means higher quality welds, faster welding speeds and less spatter. It also means greater overall operator efficiency, which assures better weldments, less weld repair and gives the operator greater pride in his work. The result: more money saved and production improved!

Because there are no moving parts, A. O. Smith welders require practically no maintenance. Quiet in operation, they are built to stand up under gruelling production schedules.

Modern successor to the cumbersome, troublesome, lumbering motor-generator set! This welding power source provides smoother arc performance, more dependable amperage at all times, instant striking arcs, and uses power only when welding! It's the only rectifier-type welder designed with high-velocity down-draft ventilation, which draws cool air in over the rectifier stacks before blasting it through the machine. Even when short-circuited at full rated amperage setting, the rectifier stacks remain below critical temperature! Stepless amperage control, effortless and accurate over the full range, assures exactly the desired setting for any job. The three-phase transformer coils are precision wound, of heavy copper, for long service life. Available in 200-, 300- and 400-amp. models.

The A. C. CHALLENGER all-purpose welder 200-, 300- and 400-amp. models

The A. C. AUTO-MAN for automatic or manual use 650-amp. model, up to 4-unit multiples available

There are A. O. Smith welding power sources for every welding need, built to the highest standards in the industry and of advanced design that makes them more desirable than any other make. Job proved in the shops of the world's largest user of welding as a production tool!

It will pay you to replace M.G. sets with A. O. Smith welders. May we suggest that you write us or contact your local A. O. Smith distributor for full particulars.

A.O.Smith
CORPORATION

WELDING PRODUCTS DIVISION, Milwaukee 1, Wisconsin

INTERNATIONAL DIVISION: MILWAUKEE 1, WISCONSIN

Highest Quality Welding Electrodes

Mild Steel	AWS Class	E6010	E6011	E6012	E6012	E6012	E6013	E6020
	A. O. Smith	SW10	SW14	SW11	SW17	SW15	SW16	SW35

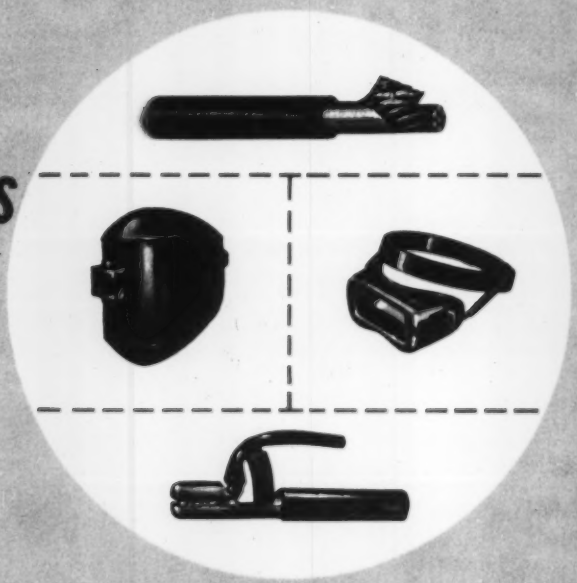
High Tensile	AWS Class	E7010	E7010	E7020	E8013	E9010	E9013	E10013	E10020
	A. O. Smith	SW75	SW80	SW76	SW86	SW95	SW87	SW88	SW101

Low Hydrogen	AWS Class	E6016	E6016	E7016	E8016	E9016	E9016	E10016	E12015	E12016
	A. O. Smith	SW64	SW65	SW84	SW81	SW90	SW89	SW100	SW120	SW103

Stainless	AISI Class	502	505	410	430	308	308	309	309	310	310	310	316	310	316	317	318	347	347
	A. O. Smith	SW151	SW152	SW153	SW154	SW162	SW362	SW166	SW167	SW159	SW359	SW169	SW168	SW366	SW160	SW161	SW158	SW157	SW357

Complete line of welding accessories

All the essentials to put welding to work are available through A. O. Smith. Quality welding cable, connectors, splicers, ground clamps, tongs, and holders; helmets, shields, gloves, and protective clothing; electrode storage ovens, machines and electrodes ... everything required for welding can be had from one responsible source. Take advantage of this for all your welding needs.

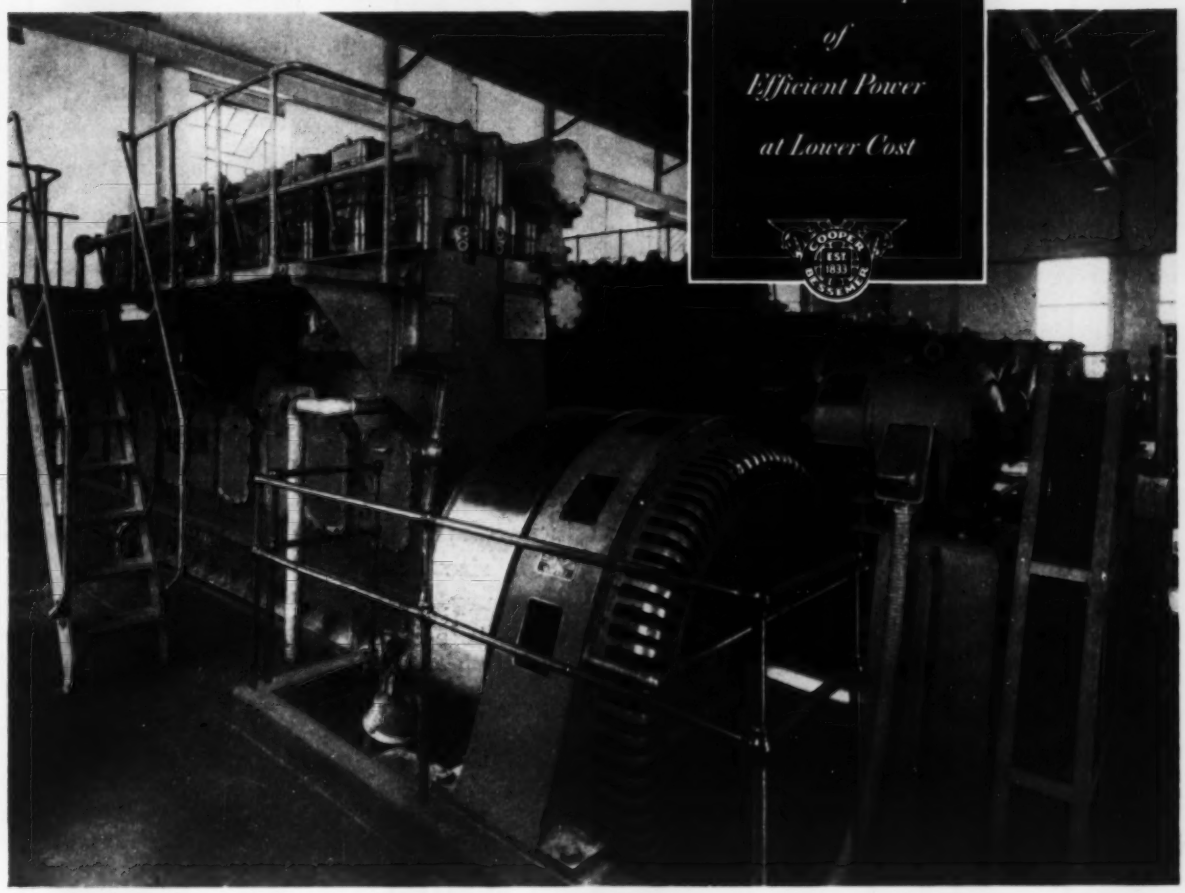


A.O.Smith
CORPORATION
WELDING PRODUCTS DIVISION
Milwaukee 1, Wisconsin
INTERNATIONAL DIVISION: MILWAUKEE 1, WISCONSIN

Made by welders . . . for welders

Interior of Hearne's municipal power plant with latest 1715 hp Cooper-Bessemer supercharged Gas-Diesel in foreground. City Manager N. L. McCarver reports that engine's fuel and lube cost averages .00252 mills per kwh.

Another Example of Efficient Power at Lower Cost



BIGGEST TAXPAYER IN THE CITY OF HEARNE

Cooper-Bessemer Gas-Diesel Power!

TO the 4,778 citizens of Hearne, Texas, modern Gas-Diesel power has been a real boon indeed. Not only does their municipal power plant produce 64% of the city's total revenue, but it is largely responsible for low property taxes, a 92-acre municipal park, a golf course, fully equipped club house and a big swimming pool with bath house, to say nothing of street lighting, free school service and other contributory services.

Hearne's base generating load is carried by two Cooper-Bessemer Gas-Diesels — 1000 hp and 1,715 hp units installed in 1947 and 1950 respectively. Fueled mostly by gas, these modern, exceptionally efficient engines last year operated at a fuel cost of only $0.002755 per kwh compared with $0.00465 for older type oil burning engines in 1946.

Says City Manager N. L. McCarver, "We made a good investment in our Cooper-Bessemers. They are not over-rated and will pull their load without the least bit of trouble. The new turbocharged engine is now down for annual check-up and is the cleanest engine we ever saw."

MOUNT VERNON, OHIO

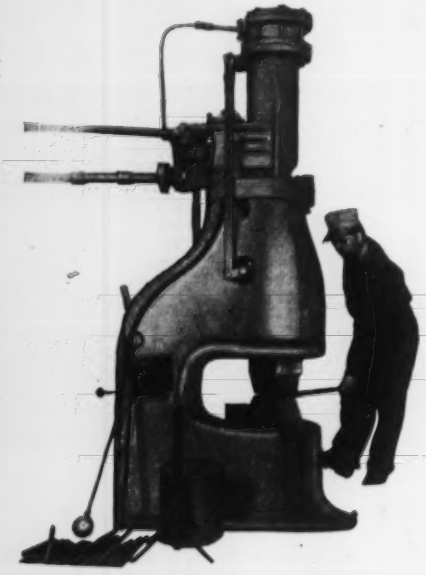
COOPER-BESSEMER

GROVE CITY, PENNA.

New York Washington, D.C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Shreveport St Louis Los Angeles Chicago Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Tulsa Gloucester, Mass. New Orleans, La.

DIESELS • GAS ENGINES • GAS-DIESELS • ENGINE-DRIVEN AND MOTOR-DRIVEN COMPRESSORS • HIGH PRESSURE LIQUID PUMPS

EVERY FOUNDRY CAN SAVE MONEY ON TOOL DRESSING HAMMERS



ADEQUATE CAPACITY AT LOW INVESTMENT

Here is the answer to the foundryman's need for a general utility forging hammer to take care of the tool dressing or general light blacksmithing work that every foundry finds need for.

Size for size there's no better buy than a Chambersburg. Costs less to install, costs less to operate, costs less to maintain. Easy to run, easy to control. Variable stroke permitting wide flexibility of operation.

SIZE POUNDS	FACE OF RAM Inches	USUAL DIE FACE Inches	FLOOR SPACE Inches	AVERAGE AIR CONSUMPTION CFM at 100 psi
100	3½x6¾	3x6½	32x20	32
150	4¾x6¾	3x6½	32x20	39
200	5x7¾	4x7	40x26	58
250	6x7¾	4x7	40x26	65
300	7x7¾	4x7	40x26	73
400	6½x9¼	5x8½	50x32	104
500	8x9¼	5x8½	50x32	116

NO NEED FOR SELF-CONTAINED COMPRESSOR. Can be run off the average foundry air line, eliminating the cost of a built-in compressor. Installation is easy. Frame and anvil are one piece, avoiding costly foundation. Most rugged hammer built. The first one we made over 50 years ago is still pounding.

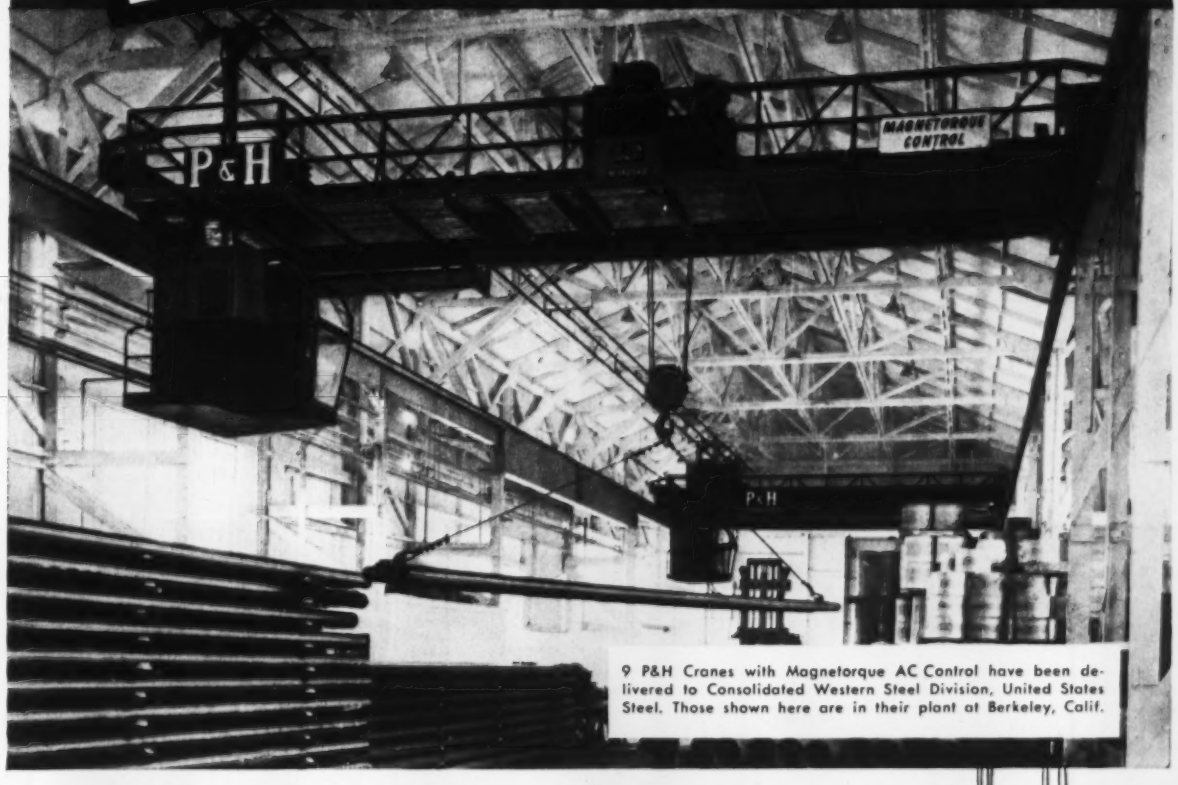
Write today for descriptive bulletin No. 7-L-8.

CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PENNA.

CHAMBERSBURG

THE HAMMER BUILDERS

P&H OVERHEAD CRANES



9 P&H Cranes with Magnetorque AC Control have been delivered to Consolidated Western Steel Division, United States Steel. Those shown here are in their plant at Berkeley, Calif.

At Consolidated Western Steel...

IT'S P&H MAGNETORQUE® for Proved Performance!

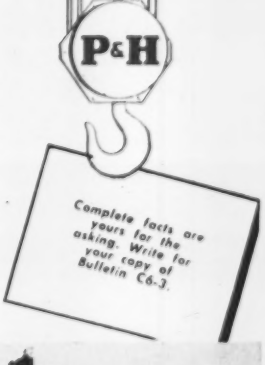
You take no chances when you choose P&H Overhead Cranes with Magnetorque AC Control! Here's the *proved* performance that gives you excellent speed control, greater dependability, and complete freedom from load brake worries.

Seventy years of leadership — that's why so many of America's leading industrial concerns have bought and re-bought P&H Cranes. And now, this great P&H development gives you the finest known speed-load characteristics in overhead crane service — with all the convenience and economy of a.c. power.

P&H OVERHEAD CRANE DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN



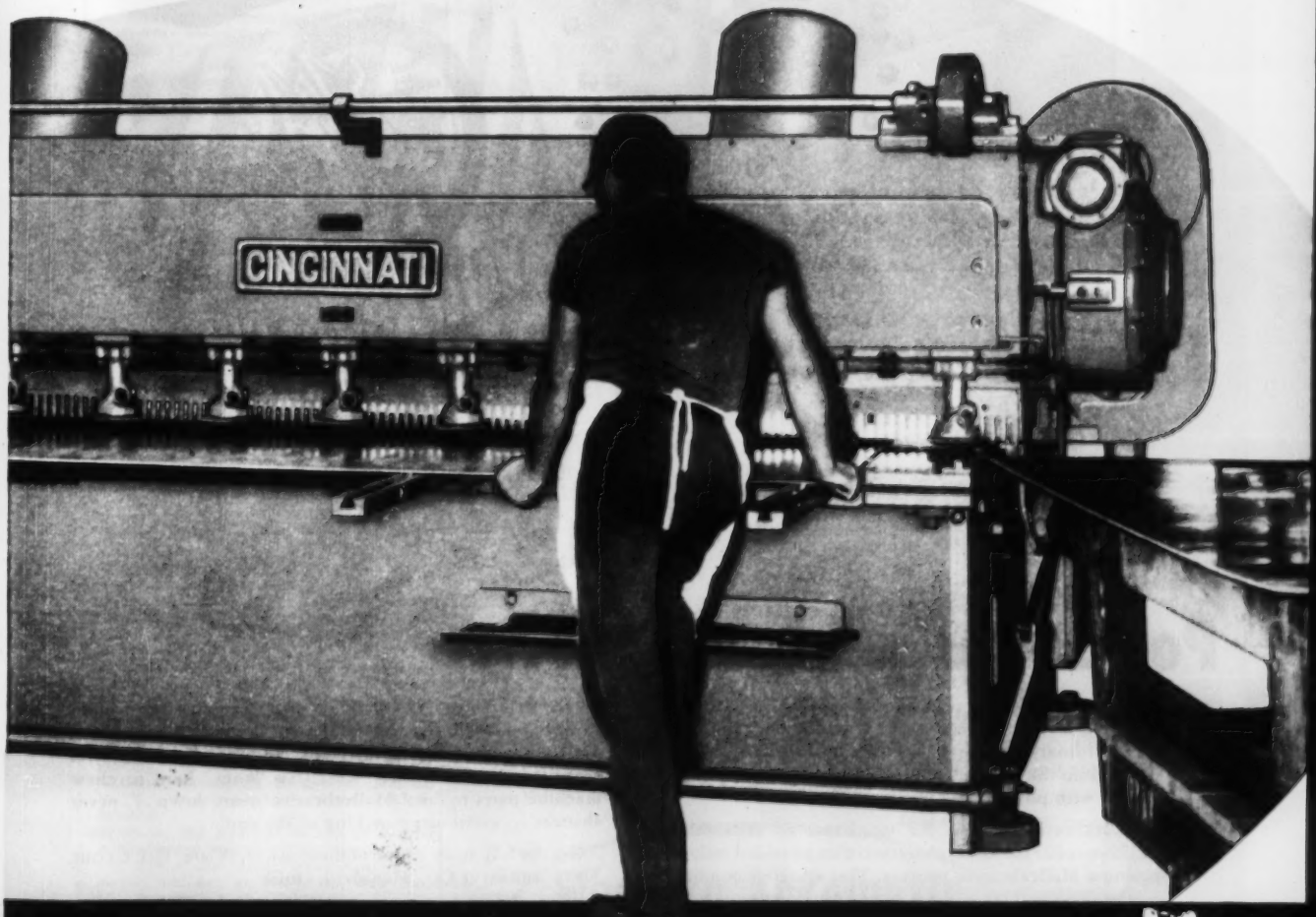
the P&H Line

modern machines MAKE modern furniture...

Photos courtesy The Troy Sunshade Company, Troy, Ohio

In this modern furniture factory, modern Cincinnati Shears give an accurate, economical and versatile performance. Ease of operation, rapid, simple gauging, holding work securely and clean cutting, all speed production and reduce costs.

Write for Cincinnati Shear Catalog S-6.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

U. S. Patent 2184926 (others pending)

Power-Packed for Profit...

Why is Malleabrasive packed with power? Because it keeps its *punch* longer . . . retains its original grain size longer! After ordinary abrasives have shattered into "fines" and passed into the dust collector, Malleabrasive *still* stays young —alive with power!

Malleabrasive has all the toughness of malleable iron PLUS peculiar hardness characteristics provided only by our patented Malleabrasive process. This amazing combination results in fast cleaning combined with tremendous reduction in wear on machine parts. That's why foundrymen agree that Malleabrasive is the iron fist for cleaning, but the velvet glove for machine parts wear. No "fines" here to chew machine parts to bits! Malleabrasive *wears* down . . . never shatters . . . continues punching to the end!

Get the full story about Malleabrasive. Write THE GLOBE STEEL ABRASIVE CO., Mansfield, Ohio.

MALLEABRASIVE®

"If you use metal abrasive, you *should* use Malleabrasive."

MADE BY THE GLOBE STEEL ABRASIVE CO., MANSFIELD, OHIO

World's largest manufacturers of Malleablized Shot and Grit
Established 1907

CALENDAR
OF MEETINGS

June 13-17, National Industrial Service Association Inc.: Annual meeting, Hotel Statler, Detroit. Association address: 818 Olive St., St. Louis. Information: Horace Barks.

June 13-17, National Association of Cost Accountants: International cost conference, Hotel Conrad Hilton, Chicago. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnerson.

June 13-18, American Society for Testing Materials: Annual meeting and exhibit, Hotels Sherman and Morrison, Chicago. Society address: 1916 Race St., Philadelphia 3. Executive secretary: Robert J. Painter.

June 14-15, Malleable Founders' Society: Annual meeting, Seigniory Club, P. Q., Canada. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

June 14-17, American Society of Mechanical Engineers: Oil and gas power conference, Muehlebach hotel, Kansas City, Mo. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

June 14-19, American Society of Civil Engineers: Spring meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society address: 33 W. 39th St., New York. Executive secretary: Col. William N. Carey.

June 15-17, Radio-Electronics-Television Manufacturers Association: Annual convention, Palmer House, Chicago. Association address: 777 14th St. NW, Washington 5. Secretary: James D. Secrest.

June 16-18, Committee on Vacuum Techniques: High vacuum symposium, Berkeley-Carteret hotel, Asbury Park, N. J. Committee address: Box 1282, Boston 9.

June 20-23, Aviation Distributors & Manufacturers Association: Mid-year meeting, Stanley hotel, Estes Park, Colo. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: H. Donald Richards.

June 20-23, National Metal Trades Association: Western plant management conference, French Lick, Ind. Association address: 122 S. Michigan Ave., Chicago 3. Secretary: Charles L. Blatchford.

June 20-24, American Society of Mechanical Engineers: Semi-annual meeting, William Penn hotel, Pittsburgh. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

June 21-23, American Management Association: General management conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

June 21-25, American Institute of Electrical Engineers: Summer and Pacific general meeting, Hotel Biltmore, Los Angeles. Institute address: 33 W. 39th St., New York 18. Secretary: N. B. Hibshman.

June 23-25, National Industrial Conference Board: Smaller business conference, Commodore hotel, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

June 23-27, American Coal Sales Association: Annual meeting, Broadmore hotel, Colorado Springs, Colo. Association address: 1625 Eye St., NW, Washington. Secretary: A. F. Kempe.

June 27-29, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y. Executive vice president: E. A. Schoefer.

June 28-30, The American Society of Heating & Ventilating Engineers: Semi-annual meeting, New Ocean House, Swampscott, Mass. Society address: 62 Worth St., New York 13. President: L. N. Hunter.

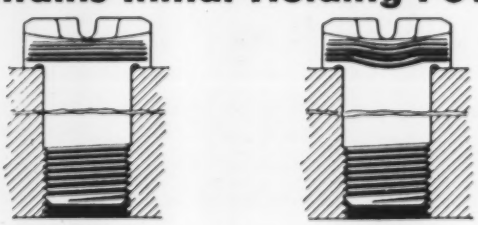
June 30, Steel Shipping Container Institute Inc.: Summer meeting, Drake hotel, Chicago. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

July 22-23, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Edgewater Beach hotel, Chicago. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Hulse.

Now! Safer-Surer Vibration Point Assembly with slotted-type "Place" Bolts by WESTERN

Now you can prevent involuntary loosening caused by vibration, impact or shock, with this unique one-piece, self-locking fastener. *Spring action* head locks bolt securely when tightened against a rigid seat, assuring vibration-proof, shock-proof holding power. Greater elastic elongation in both head and shank drastically reduces fatigue failure. These economical, re-usable bolts, made of either cold forged carbon or alloy steel, are available in a wide range of standard sizes in both Coarse and Fine series threads. Write today for folder and prices.

Maintains Initial Holding Power



UNSEATED SEATED

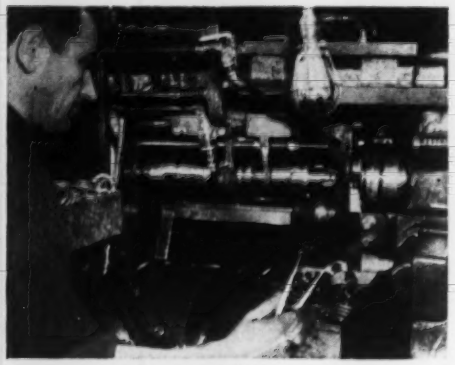
Controlled spring action in the slotted-type "PLACE" BOLT head when tightened against a rigid seat augments the elastic elongation of the bolt shank in safeguarding against the loss of initial bolt tension.

Licensed under U.S. Patent No. 2543705

Western Automatic Machine Screw Company
377 Woodland Ave., Elyria, O.

Precision Screw Products, Parts and Assemblies Since 1873

FREE-MACHINING ENDURO STAINLESS STEEL BARS



Put parts in the pan 90% as fast as Bessemer screw stock

You can give duplicate parts the high physical and chemical properties of stainless steel. And, you can do it without a heavy production penalty!

Simply set up and run Free-Machining ENDURO Stainless Steel Bars. They'll respond beautifully at every station on your automatics. Two grades are fully 90% as machinable as Bessemer screw stock.

These high-quality bars are cold-finished by Republic's Union Drawn Steel Division. They provide close tolerance, accuracy of section, uniform soundness, and fine surface finish.

Free-Machining ENDURO also is available in hot-rolled bars and in wire. Republic metallurgists and machining advisers are ready to help you apply ENDURO every step of the way. Just write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • *Massillon, Ohio*
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

NEW! **96-page pocket size booklet, "How To Machine Republic ENDURO Stainless Steel Bars." Packed with machining tips, tables of feeds and speeds, stainless steel properties, other vital information. Write Republic. Ask for ADV-607. FREE!**

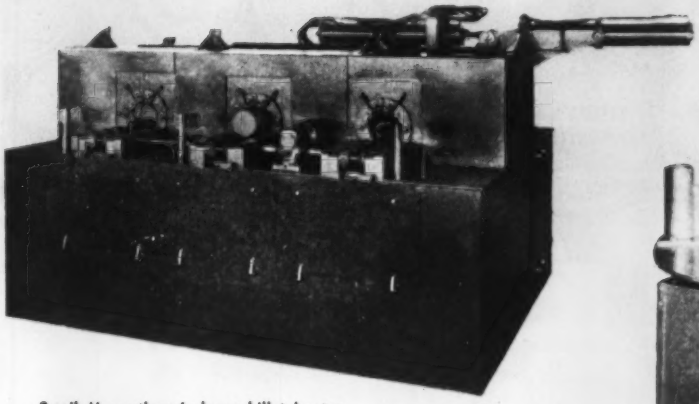
REPUBLIC ENDURO FREE-MACHINING STAINLESS STEEL

REPUBLIC STEEL

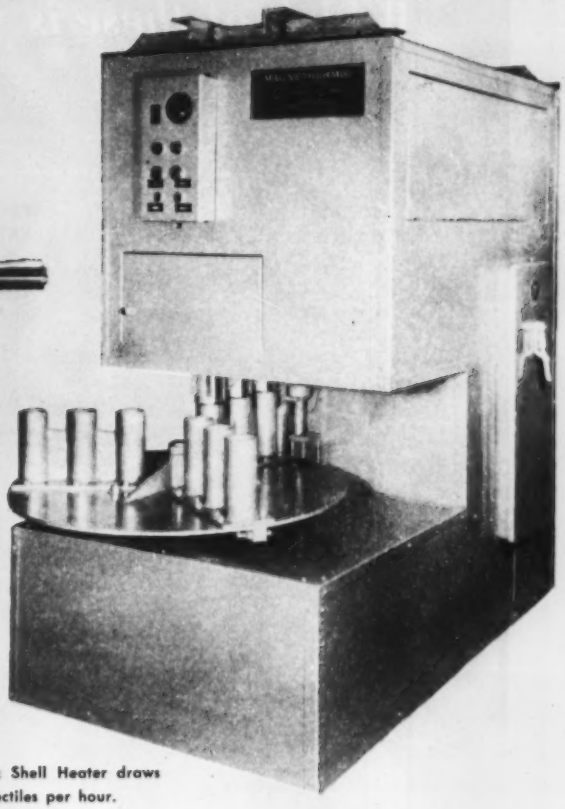
Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Bars, Wire, Pig Iron, Steel and Plastic Pipe, Bolts and Nuts, Tubing

Why, Where, How and Wherefores...

of low-frequency (60-cycle) induction heat



3-coil Magnethermic brass billet heater is rated at 8,000 pounds per hour.



This Magnethermic Shell Heater draws 200 (75 mm) projectiles per hour.

HERE'S THE WHY

Rapid and penetrating heat ... preheating an 8″ dia. copper or brass billet in less than two minutes . . . on a production basis. Temperature of each billet is measured. Cold or over heated billets cannot reach the press. No need to schedule billets ahead of time. A Magnethermic Heater is always ready to go without warm-up time. Press the button and you have a hot billet immediately.

HERE'S THE HOW

You require a heater with either single, double or three coils, depending upon your production. A Magnethermic engineer will come to your plant and outline what you need and answer any of your questions. Setting up for low-frequency (60-cycle) heating is not complicated. Installation can be made in a matter of hours and floor space is at least a third less than for conventional furnaces.

HERE'S THE WHERE

Use this penetrating heat for preheating, prior to hot working such as forging or extruding. You can heat rounds, squares, hexes . . . in lengths from slugs up to long bars. The diameter range: Steel (carbon or stainless) above 4″ dia.; Brass above 2″ dia.; Aluminum above 1″ dia.; Titanium above 4″ dia.

For example, this method has proved successful for annealing steel parts or preheating gears prior to shrinking or hardening.

HERE'S THE WHEREFORE

The Magnethermic heats scale-free. An added incentive—this heat can be accomplished inexpensively in an inert atmosphere. Magnethermic has pioneered the use of low-frequency (60-cycle) induction heating and has installed most of the heaters in use. Much research on low-frequency (60-cycle) induction heating has been done in Magnethermic's research laboratories. Use this experience to help you decide which is the best heating method for your production.

60—CYCLE

MAGNETHERMIC

corporation

3990 SIMON R... YOUNGSTOWN 7, OHIO

INDUCTION HEATING

Your inquiry . . .

If you want information on a Magnethermic Heater for your plant, let us know what size billet you intend to heat; for what use; and desired production rate. Your inquiry will receive prompt attention.

Which of these is your pumping problem?

Name just about any fluid you consider "hard to handle" and we will show you a De Laval pump that will do the job efficiently and at low cost.

De Laval IMO and CPO pumps have solved problems on a wide range of products—hot or cold, acidic or alkaline, viscous or corrosive, clear or filled with suspended solids. IMO and CPO models are available for early delivery.

Your De Laval representative is an experienced application engineer. Consult him on your pumping problems.

DE LAVAL IMO PUMPS
capacities to 750 gpm
pressures to 1500 psig
Write for Bulletin LG-A

DE LAVAL CPO PUMPS
capacities to 2000 gpm
heads to 200 feet
Write for Bulletin 1125-B

DE LAVAL *Pumps*

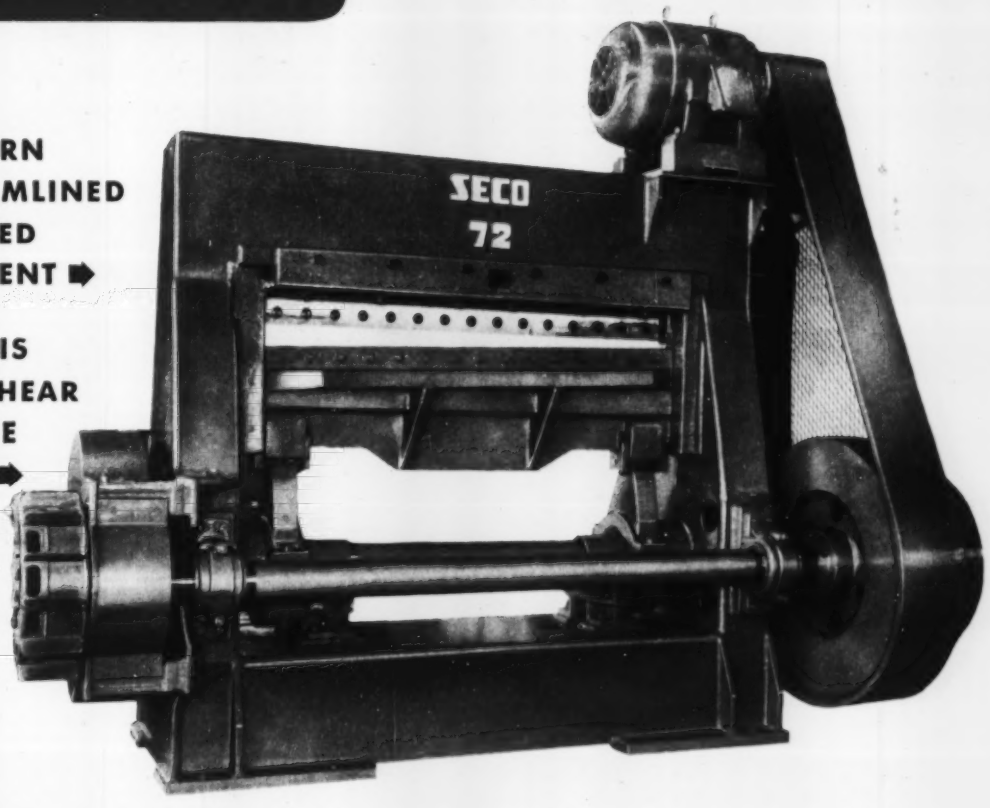
DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

DL 236A

SECO 72" UP-CUT SHEAR

MODERN
STREAMLINED
RUGGED
EFFICIENT ➡

HERE IS
THE SHEAR
OF THE
YEAR ➡



offers

- **High Volume, Dependable Performance**
- **Low Cost Operation and Maintenance**

SECO DESIGNS AND BUILDS STEEL MILL EQUIPMENT

Leveling and Shearing Lines
Combination Edging and Flattening Lines
Tension Reels for Strip Polishers
Narrow Strip Grinding Machines
Multiple Strand Pull-Out Rolls and Take-Up Frames
Strip Coilers, Up and Down Types
Traverse Reels for Narrow Strip
Coil Up-Enders • Scrap Ballers

This new SECO 72" Up-Cut Shear is designed and built for rugged, heavy duty service in (a) Leveling and shearing lines (b) In coil build-up lines for squaring coil ends prior to welding (c) In processing lines where shearing is required.

Shearing capacity is ¼" stainless, or ⅜" low carbon steel up to 72" wide...cutting in lengths from 2 feet or any increment up to 16 feet or longer...shearing speed 60 cuts per minute. The drive consists of a 20 H. P. motor, multiple V-belts, Fawick Airflex clutch with a heavy fly wheel, Airflex brake and rotary limit switch.

Features of the SECO 72" Up-Cut Shear are: one piece frame, rigid box section of all steel welded construction; anti-friction bearings on drive shaft; knuckle-joint plus pin for connecting pitman to lower ram; adjustable bolster for upper knife, permitting easy and quick clearance setting between knives with 4 cutting edges.

A modification of this shear is our "Tri-Cut" Shear, handling three strands side by side, with individual shearing selection.

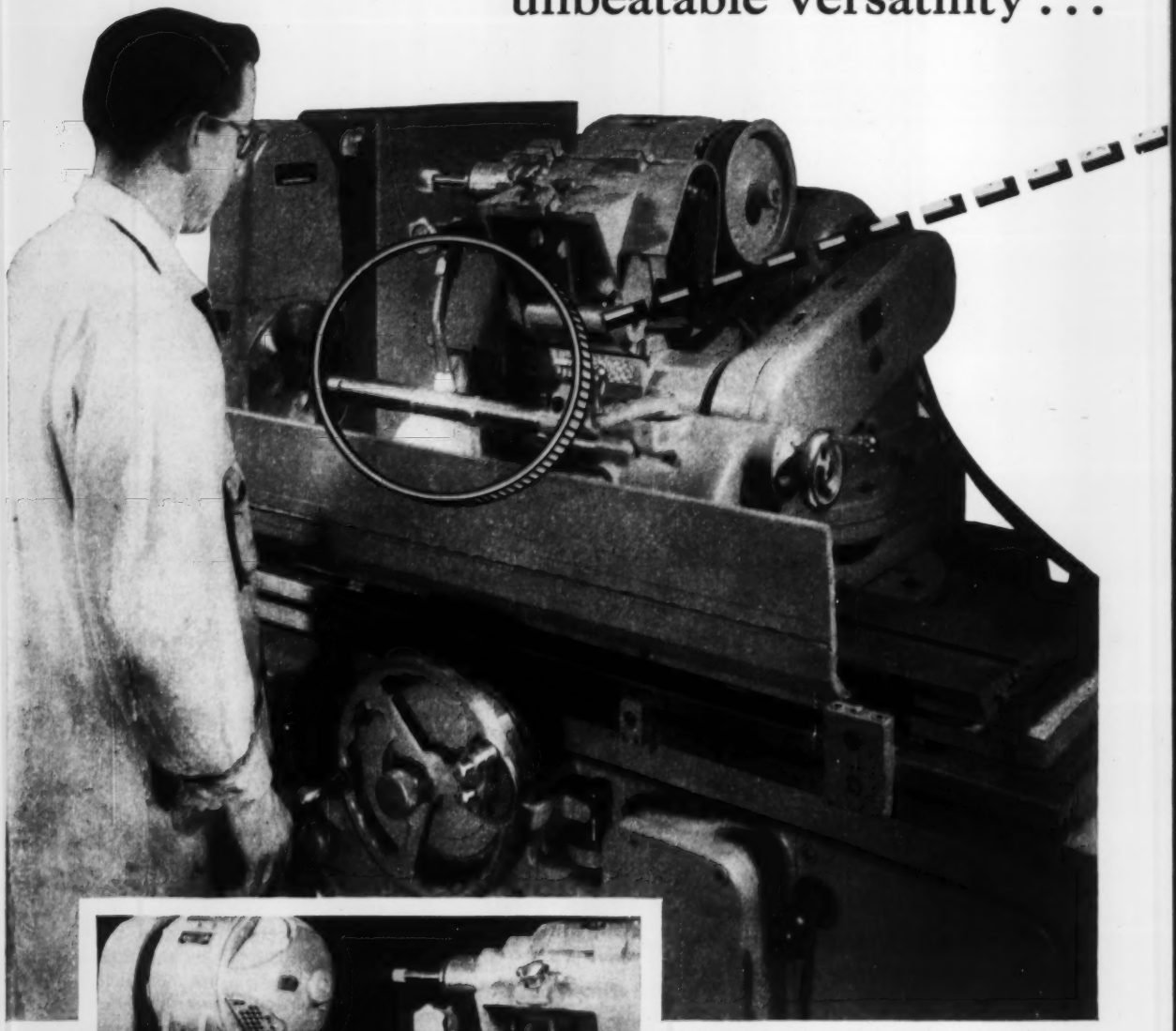
WRITE US FOR FULL INFORMATION OR CONSULTATION

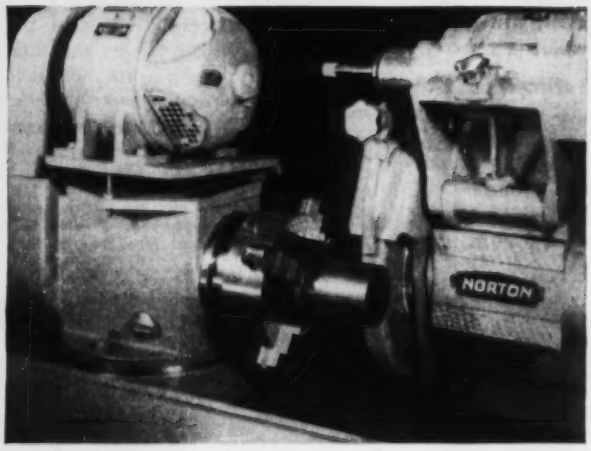
STEEL EQUIPMENT COMPANY

20805 AURORA ROAD • CLEVELAND 22, OHIO

SECO

NEW Type U4 Norton Universal Grinders — 12"x36" and 12"x48" — feature unbeatable versatility . . .





Quick, Easy Set-Ups plus fast grinding action enable this new Norton 12" grinder to cut time and costs in a wide variety of external, internal, face and angular wheel feed grinding jobs. Here the internal grinding spindle is shown swung up and out of the way while a shaft is being ground.

Permanent Chuck Mounting is an outstanding advantage. Headstock spindle has a dog drive plate on one end. On the other is a 5" D-1 cam lock nose, on which you can leave a chuck mounted permanently — merely swiveling headstock 180° to start chucking jobs faster.

do more jobs ... save more $$$

Greatly simplified set-ups give you more time for grinding

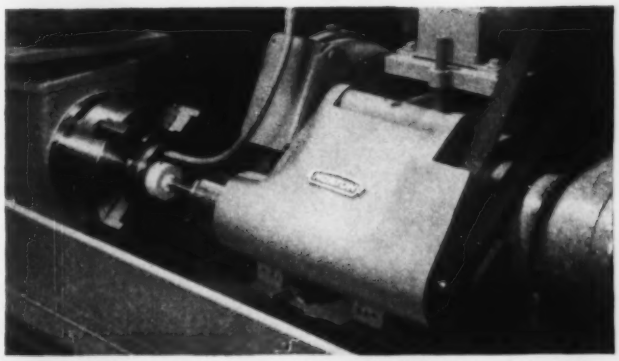
Double-barreled good news! The new Norton universal grinders are made in 12″ x 36″ and 12″ x 48″ work capacities!

Versatility keynotes the design, with feature after feature increasing the job range and cutting operating costs. For example, take the work speed range of 40 to 400 r.p.m. You get an infinite number of speeds over this wide range, simply by turning a dial.

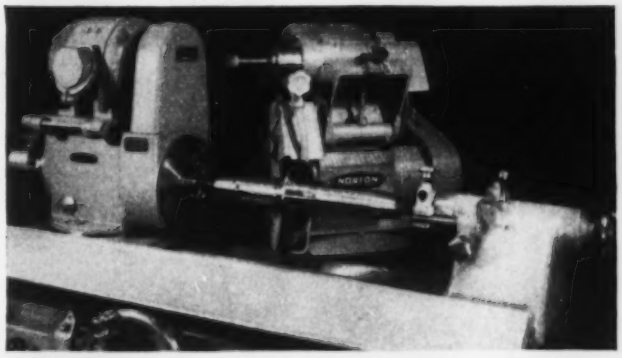
Other important features are illustrated here. It will pay you to look them over carefully — and consider their advantages in your own production.

Get the whole story

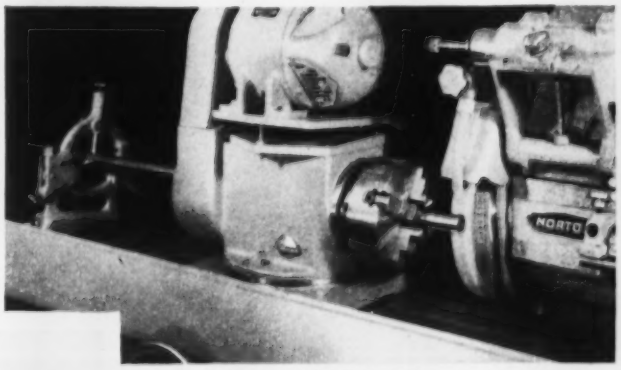
on the broad operational scope and fast, precision performance of these new Norton 12″ grinders. See your Norton Representative, or write us direct. And remember: only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower cost. NORTON COMPANY, Machine Division, Worcester 6, Mass. *In Canada:* J. H. Ryder Machinery Co., Ltd., Toronto 5.



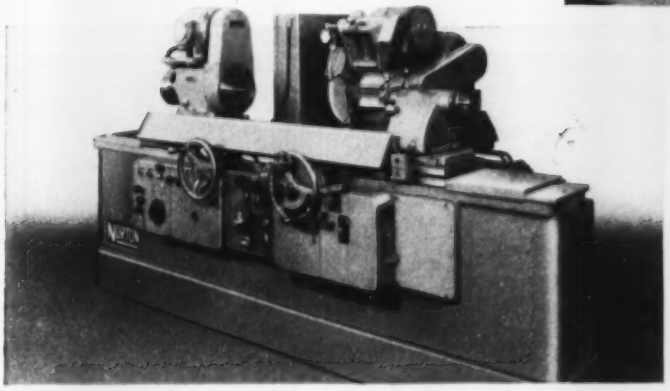
For Quick Change-Over to or from internal grinding, the internal grinding spindle is permanently hinged to front of wheel slide. This also enables you to perform both internal and external grinding on a single workpiece without changing the set-up.



Settings At Any Angle are possible for both wheel and feed, independently, with this compound wheel head slide. Wheel head has swivels above and below the slide ways; upper wheel head member can be positioned to extend capacity when wheel head is swiveled.



Greater Shaft-Grinding Capacity is assured by the hollow spindle in the headstock. A 1¼″ hole clear through the headstock spindle permits passage of shafts that may be longer than the machine — another typical advancement that means greater versatility and usefulness.



Advanced Design includes combined lever and handwheel operated footstock, electrical controls grouped in raised cabinet, pumps and motors easily accessible, table-ways pressure-lubricated from outside reservoir, ramped outlet from coolant tank to assist clean-out.

To Economize, Modernize With NEW

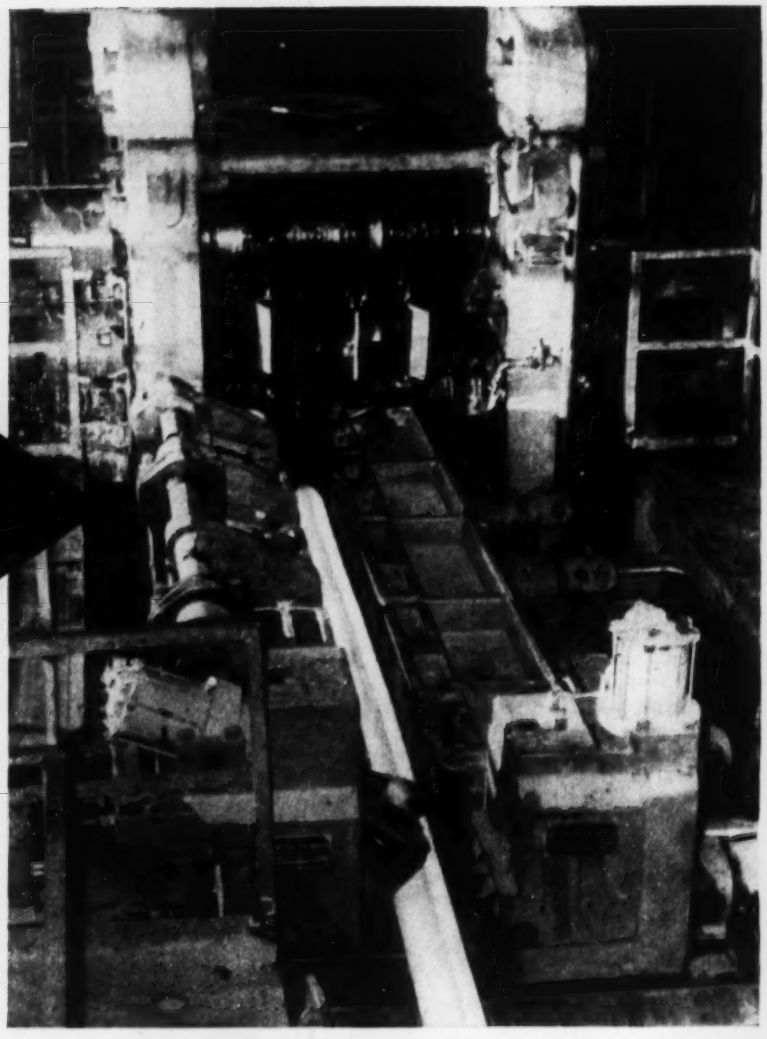
NORTON

GRINDERS and LAPPERS

Making better products ... to make other products better

District Sales Offices: Worcester • Hartford • New York
Cleveland • Chicago • Detroit

for maximum tonnage



BIRDSBORO / STEEL MILL MACHINERY

Designers and Builders of:
STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

• This 3-high mill is equipped with a tilting table, side guard manipulators, finger lift for turning square and rectangular shapes, and auxiliary manipulator for turning diamonds and squares. It is just one example of how Birdsboro engineers can help you boost your tonnage, and reduce labor costs. For a single piece of machinery or a complete new plant, it always pays to call on Birdsboro.

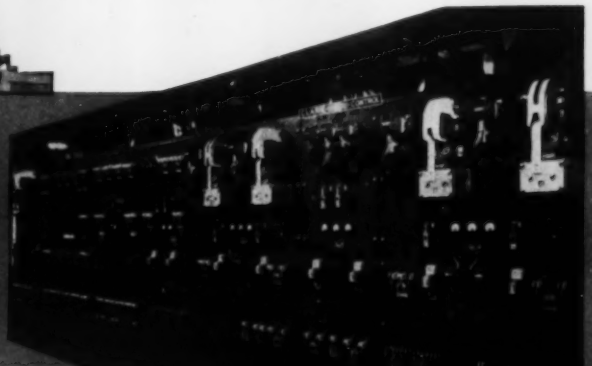
MM-33-54

BIRDSBORO

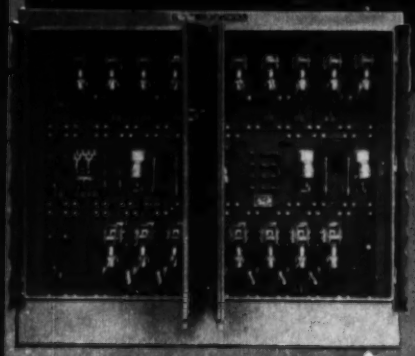
BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

CLARK CONTROL *at* FAIRLESS WORKS

Control panel for Side Trimming and Shearing Line.

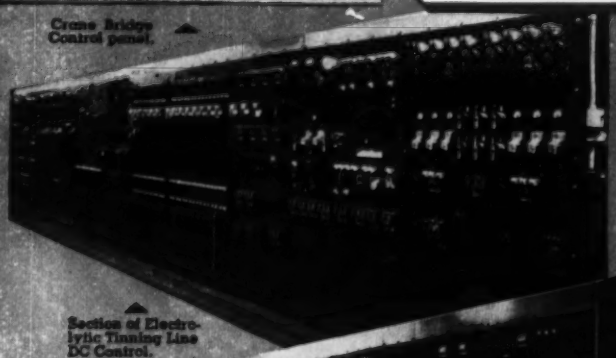


Control for Aetna-Standard 49" Side Trimming and Recoil Line.

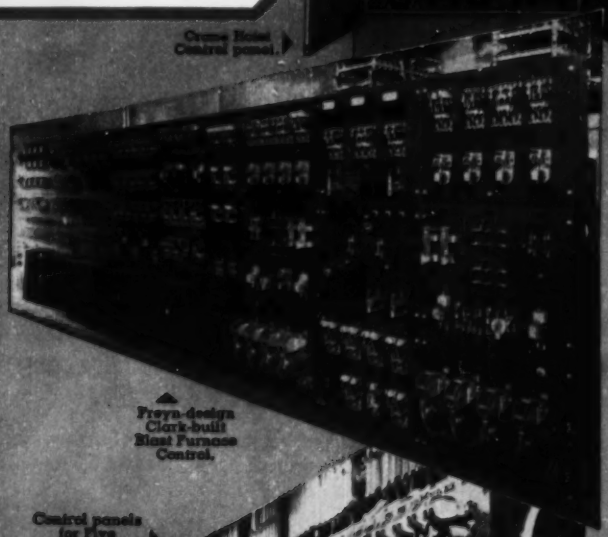


• U. S. Steel uses CLARK control equipment for dependable electric control of many of its vital production operations at The Fairless Works. Shown here are some of the CLARK control panels in this gigantic mill . . . Steel mill control is a CLARK specialty and the Fairless Works installations are further proof of the confidence large steel producers place in CLARK engineering and CLARK equipment.

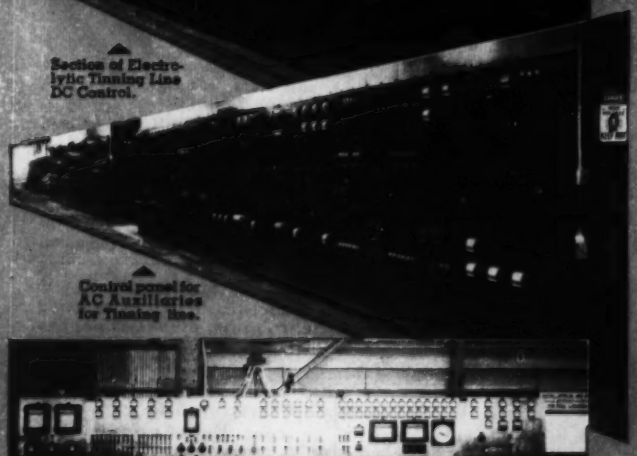
Crane Bridge Control panel.



Crane Hoist Control panel.



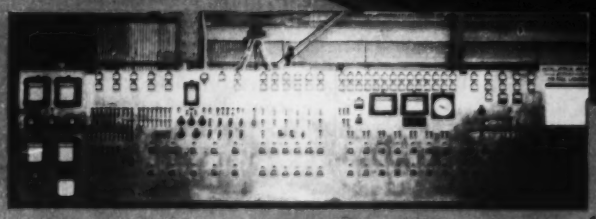
Section of Electrolytic Tinning Line DC Control.

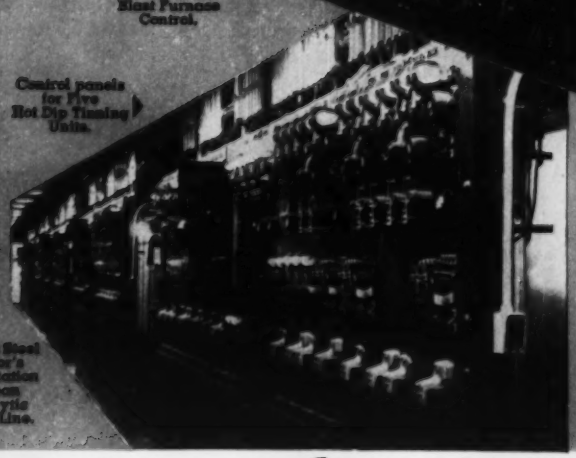


Freyn-design Clark-built Blast Furnace Control.

Control panel for AC Auxiliaries for Tinning line.

Control panels for Five Hot Dip Tinning Units.





Stainless Steel operator's control station for Weon Electrolytic Tinning Line.

The **CLARK CONTROLLER** *Company*

ENGINEERED ELECTRICAL CONTROL

1146 EAST 152nd STREET • CLEVELAND 10, OHIO

. . . economically . . . quickly with ENTHONE metal strippers

ENTHONE has developed **8** outstanding metal strippers which, without attacking your base metal in any way, quickly and economically strip off defective plated coatings, excess solder, silver brazing metal, and metal smuts.

Where your base metal is . .	and you want to strip nickel, copper, silver, zinc or cadmium chemically, use **ENSTRIP "S"**, an additive for sodium cyanide solutions, or . . . **ENSTRIP "A"**, which is a prepared compound containing sodium cyanide.
STEEL	where you want to remove copper or nickel coatings electrolytically, use **ENSTRIP 103**, an economical alkaline electrolytic stripper containing no cyanide.
COPPER or STEEL	and you wish to dissolve tin, lead, or tin-lead coatings chemically, use **ENSTRIP "TL"**, a fast acting, alkaline stripper.
ALUMINUM, COPPER or STEEL	and you want to take off heavy chromium coatings chemically, use **ENSTRIP "CR-5"**, a rapid, acid type stripper.
COPPER ALLOYS	use **ENSTRIP "165-S"**, an additive for acid solutions that will give you quick removal of nickel, tin, zinc, lead or cadmium.
ZINC DIE CASTINGS	use **ENSTRIP "L-88"**, an acid electrolytic stripper for removing chromium, nickel or copper coatings.

Write directly to Enthone Incorporated, or to your nearest Enthone Service Representative, for further information.

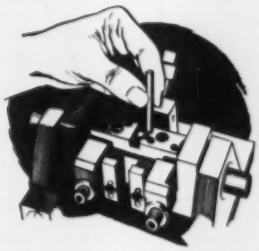
ARDCO, INC.,
5000 West 73rd Street,
Chicago 38, Illinois

R. O. HULL & COMPANY,
1300 Parsons Court,
Rocky River, Ohio

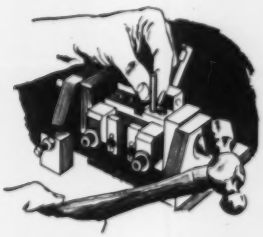
L. H. BUTCHER COMPANY,
3628 East Olympic Boulevard,
Los Angeles, California

** The Scientific Solution of Metal Finishing Problems*

UNBRAKO Precision-Ground Dowel Pins are widely used for aligning parts, as in dies, jigs and fixtures. This radius grinding fixture, for putting a flat on electronic shafting, is a good example of such an application.



Assembler inserts formed end of UNBRAKO dowel pin into hole preparatory to tapping it into position.



Formed ends, with continuous grain flow, won't chip. Uniform heat treatment permits UNBRAKO dowel pins to be driven in and out of holes without upsetting.

UNBRAKO dowel pins—made of heat treated alloy steel—have a surface hardness of 60-62 Rockwell "C" Scale; a surface finish of 6 microinch maximum; a core hardness of 50-54 Rockwell "C" Scale; an average single shear strength of 150,000 psi; and a diameter tolerance of ±0.0001". They are available in two standard sizes in diameters from ⅛" to 1".

Keep your inventory at a minimum

Use UNBRAKO Standards—stocked by your distributor

Because your UNBRAKO distributor stocks a full line of standard UNBRAKO socket screw products, your inventory is lowered. This ready supply not only cuts your investment, but gives you faster delivery and reduces your buying costs. For a complete listing of standard UNBRAKO products, see your distributor or write STANDARD PRESSED STEEL CO., Jenkintown 33, Penna.

UNBRAKO® SOCKET SCREW DIVISION

SPS JENKINTOWN PENNSYLVANIA

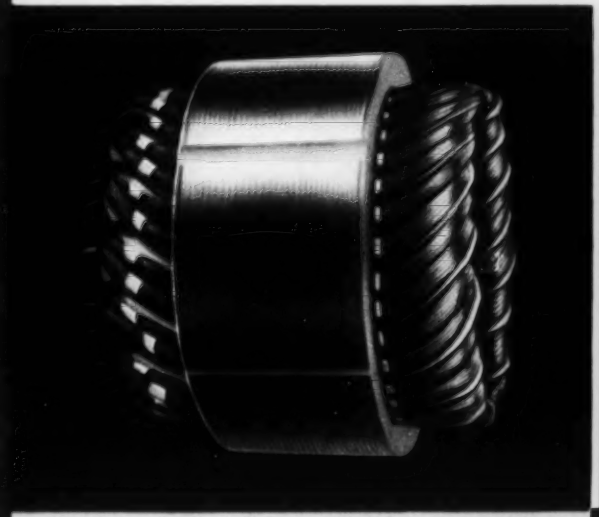
Get Greater
with New Features

Motor Economy
. . . Proved Principles

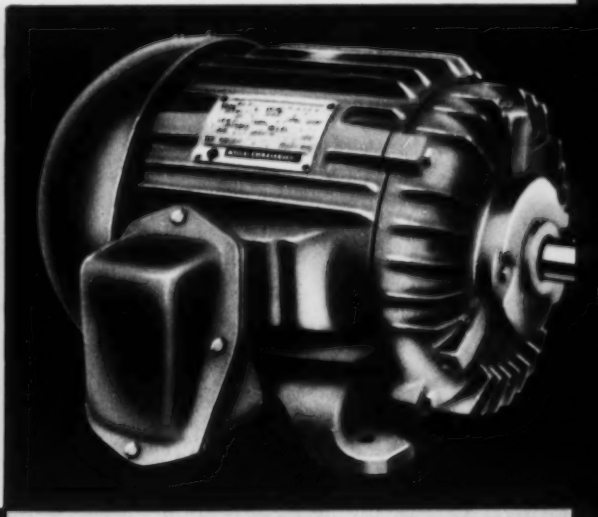
Here's the inside story of a great new motor. It combines the best of the new developments in methods and materials with the best of the tried and proved principles that have made such an outstanding record for Allis-Chalmers motors.

Smaller in size than previous design, it retains the easy-to-clean, fin-type construction which Allis-Chalmers pioneered several years ago. The bearing design gives greater bearing protection, ease of maintenance and long life. Insulation gives you famous Allis-Chalmers rugged dependability.

Consult your nearby Allis-Chalmers Authorized Distributor or District Office on your motor needs. Or write for Bulletin 51B6210.



STATOR DOUBLE INSULATED —Stator laminations are welded across back for rigidity. Heavy varnished cambric insulation is inserted between phase windings. Wound stator is dipped several times in special insulating varnish of proved effectiveness and stamina, and baked after each dip. The Allis-Chalmers stator is both physically and electrically strong . . . thoroughly protected against moisture, heat and corrosion.



FIN-TYPE CAST-IRON FRAME — Proved by years of service. Cooling ribs are cast integrally with the yoke; air is blown over them without restriction. There are no enclosed external air passages to clog up with dirt and thereby ruin cooling efficiency. Radiating surface provides reserve cooling capacity for extra strenuous duty. Cleaning, if required, is a few moments work with an air hose, brush or vacuum cleaner.

Multiple bearing protection keeps grease in... keeps dirt out...permits relubrication in service

Extreme care has been taken to provide longest possible bearing life and lowest possible maintenance costs. The bearing itself is of double-shielded type, which allows controlled migration of grease in and out of the bearing to suit operating conditions. Yet bearing is protected against greatest cause of bearing trouble — overgreasing.

Close running clearances and double labyrinth seals between the shaft and outer bearing housings keep grease in the bearing and exclude dirt. Grease is kept out of the interior of the motor by a bearing cap with a long running clearance along the shaft. The cap is held tightly in place by hex head cap screws. Large grease chambers hold an ample supply of lubricant.

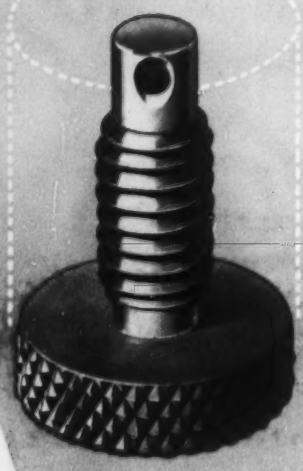
A-4363

ALLIS-CHALMERS

MILWAUKEE 1, WISCONSIN

CAMCAR COLD-FLOW

WATCHES THE WASTELINE



Old Method
Metal Waste 75.3%

Camcar Cold-Flow reduces metal *waste* to only 3% in the production of this part . . . a 75% savings over the old method. Cold-Flow keeps the waste in line . . . saves material . . . *forms* parts by metal flow . . . in contrast to older methods that *cut* parts from large diameter stock.

Cold-Flow works on a strict diet — in high and low carbon steels, copper, brass, aluminum, stainless and many others — creates intricate shapes to meet exacting assemblies . . . and in high volume.

The Cold-Flow principle of high speed metal flow increases part strength, lengthens life . . . for the metal grain smoothly follows the part contour. And Cold-Flow compresses outer fibres to achieve greater surface hardness . . . more wear resistance.

Cold-Flow
Metal Waste 3%

Send us requirements,
specs and samples.
Or ask for a field specialist.

CAMCAR COLD-FLOW

CAMCAR SCREW & MFG. CORP.
ROCKFORD, ILLINOIS
Telephone: 5-9451 • Teletype: RK-8653

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rely on Fairbanks-Morse

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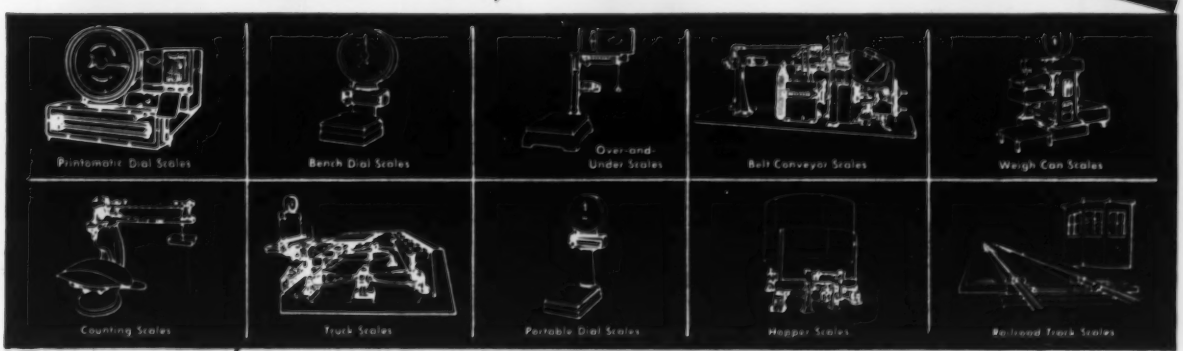
Your nearby Fairbanks-Morse Scale Specialist will be glad to tell you about the scales specifically designed for your type of business. See him soon, or write to Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois.



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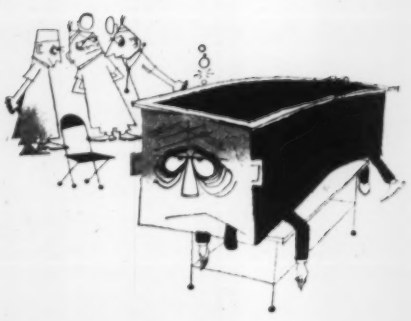
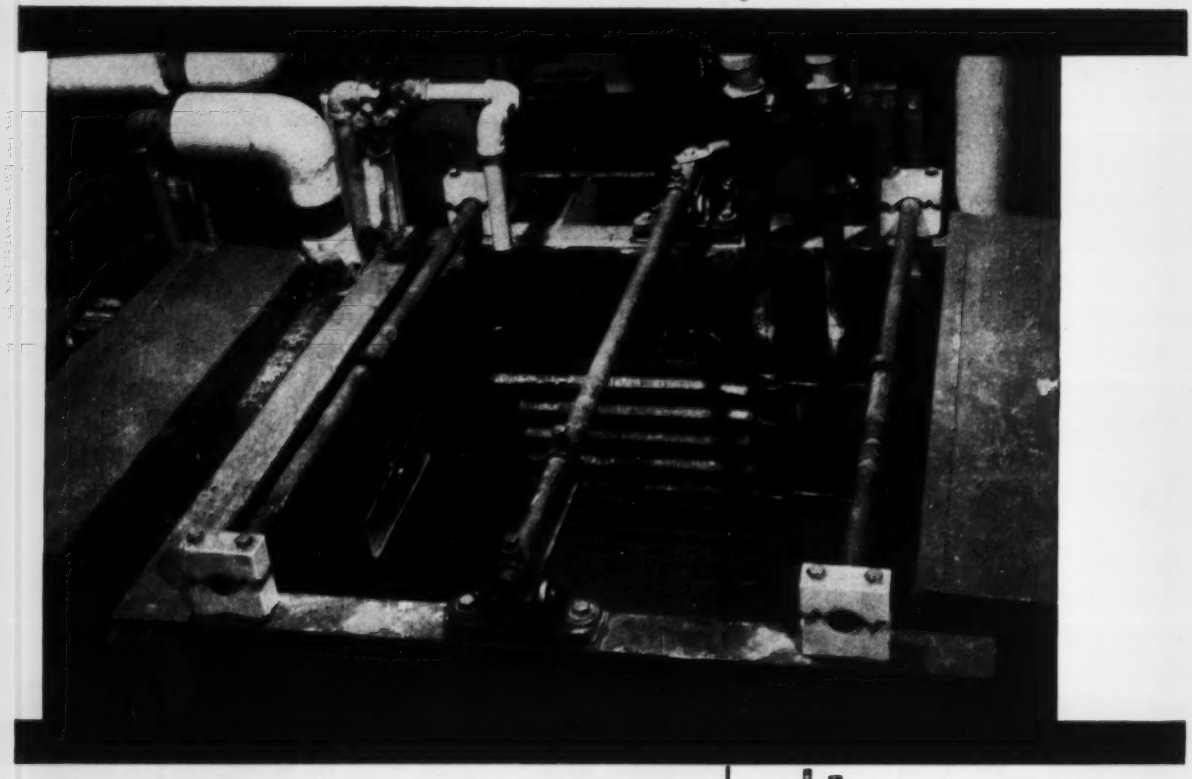
RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

new Wyandotte Research Laboratory uses PLATECOILS to prevent coil-itis *

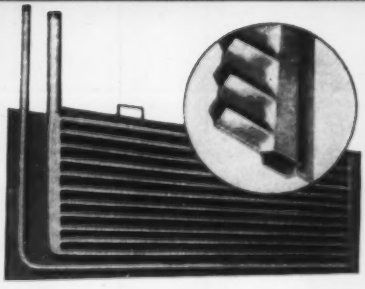
One of the finest technical laboratories in the country is the new Research Laboratory of Wyandotte Chemicals Corporation, Wyandotte, Michigan. A key feature of this laboratory is a series of 100-gallon plating and cleaning tanks made of various materials, such as rubber and plastic, which resist the actions of different types of chemicals. Individual tanks can be heated from room temperature to 212 degrees in less than an hour, by the Platecoil heat transfer units in the tanks. "We find Platecoil to be ideal because of their easy-to-clean surfaces and standardized performance," reports A. W. Liger, Supervisor of Industrial Research.



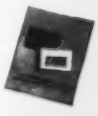


PLATECOILS replace pipe coils for 50% of the cost

* Coil-itis is the constant doctoring of wet processing tanks for pipe coil troubles. It can be cured easily by replacing pipe coils with Platecoils. Immediately, you will notice the difference as Platecoils put new life and profits into your heat transfer processes. They heat or cool 50% faster and take 50% less space in the tank. They save as much as 50% in initial cost and 50% in maintenance costs in addition to overcoming the limitations and operating difficulties of old fashioned and outmoded pipe coils.

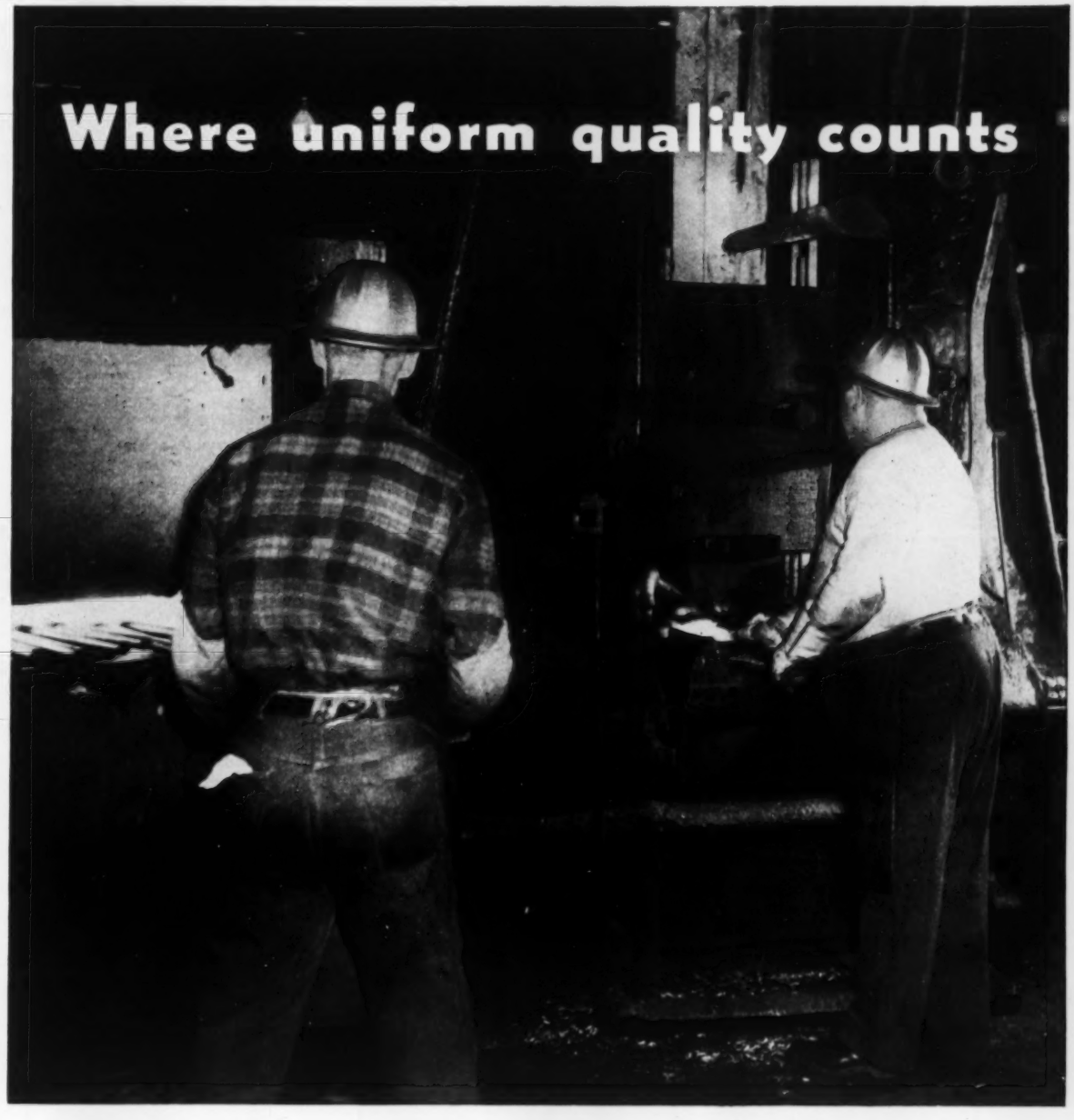


Bulletin P72 shows how Platecoils are replacing pipe coils at a savings throughout industry. Send today for your copy.



Platecoil Division, TRANTER MANUFACTURING, inc., Lansing 4, Michigan

For fast shipment see your local distributor



● It's in the heating furnace and the forging press that the dependable quality of Youngstown Hot Rolled Alloy Bars shows up. Operators know that Youngstown bars are uniformly free of injurious seams, piping, laps and cracks. That insures maximum output of defect-free products.

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THE YOUNGSTOWN SHEET AND TUBE COMPANY
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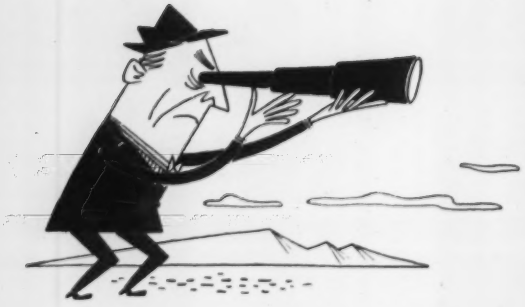

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Because instruments have become such vital links in the production chain, Honeywell has developed a service organization that is the largest of its kind in the world. No matter where you may be, there's a Honeywell service man near you . . . in more than 110 service centers spotted strategically throughout the United States and Canada.

A wire or phone call to the nearest of these centers will bring help in a hurry . . . often in a matter of hours. And the service you get is expert. Honeywell men are trained, by factory schooling and field experience, in the most modern methods of keeping good instruments in peak condition.

Frequent check-ups *prevent* emergencies . . . protect your instrument investment. The economical way to do this is a Periodic Service Contract, which brings a Honeywell man to your plant at regular intervals to inspect, clean and adjust your instruments and controls. Your local Honeywell office will be glad to give you full details, and to arrange a custom-fitted contract for your requirements.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

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BROWN INSTRUMENTS

First in Controls

. . . will roll foil from .00035"
at speeds up to 4000 fpm
depending upon gauge thickness

To roll out thin sheets of aluminum at speeds up to 4000 feet per minute has taxed the ingenuity of the finest rolling mill engineers. But there are now over one hundred modern Lewis Foil Mills in operation, such as the 9" and 21" x 44" units shown in the illustration.

These mills generally start with .030" or .026" sheet . . . and for standard gauge foil reduce it to .00035" . . . at speeds ranging from 1000 to 4000 feet per minute.

Built in various sizes and widths to meet individual customer's requirements, these Lewis Foil Mills include the latest design in bearings, electric tension control and thermal control.

The thermal control is the key to successful operation and high production in foil rolling. It permits rolling of very thin metal at lower maximum tension and the production of full coils, evenly balanced in tension . . . which reduces breakage to a minimum. Coils from 3000 to 3500 pounds are being rolled.

Most of the mills are used for rolling aluminum foil, but they are equally adaptable for rolling all metals of light gauges. So if you have a problem in rolling thin metals, we'll be glad to give you complete information on the design and specifications of Lewis four-high Foil Mills . . . which can be built to your requirements.

In fact, if you have any problem involving rolling mill machinery, our experienced engineers and modern manufacturing facilities are always available.

LEWIS four-high FOIL MILL

BLAW-KNOX COMPANY • LEWIS MACHINERY DIVISION
PITTSBURGH 22, PENNSYLVANIA

BLAW-KNOX

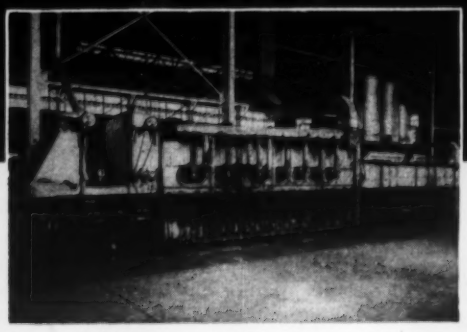
LEWIS PRODUCTS: Two-High Mills • Three-High Mills • Four-High Mills • Bar, Billet and Structural Mills
Rod Mills • Coilers • Tables • Shears • Levelers • Pinion Stands • Gear Drives • Roll Lathes • Flaking Mills

Gas-fired copper billet heating furnace, where billets are heated prior to processing.

AT

REVERE COPPER AND BRASS INCORPORATED

LOS ANGELES, CALIFORNIA



Dempsey Gas-fired annealing furnace in the Los Angeles plant of Revere Copper and Brass Incorporated.

GAS is a production line tool

IN THE MANUFACTURE OF RODS AND TUBES for industrial, maritime, and plumbing applications, GAS provides the type of precision heat treating needed at Revere Copper and Brass Incorporated.

For instance, Revere eliminates the cold-draw cycle by using a Gas-fired annealing furnace to bring the billets right up to extrusion temperature. Bright annealing too is done by heat treating the copper tubing in controlled atmospheres in a large, Gas-fired furnace.

These methods of heat treating with GAS at Revere have the added advantages of automatic control, which makes it possible to maintain precise temperatures at all times with complete flexibility of operation.

Throughout *all* industry, GAS is a production-line fuel. Why not call your Gas Equipment Dealer or Gas Company Representative right away, and find out where GAS may help you improve the efficiency of your operation.

MORE AND MORE... THE TREND IS TO GAS

AMERICAN GAS ASSOCIATION

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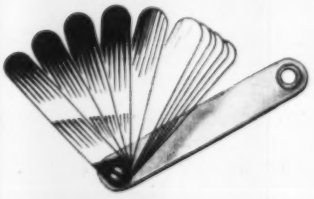
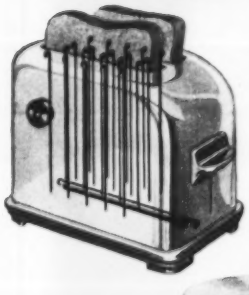
with

NATIONAL-STANDARD

Wire and High Carbon Strip

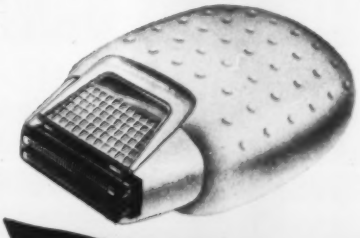


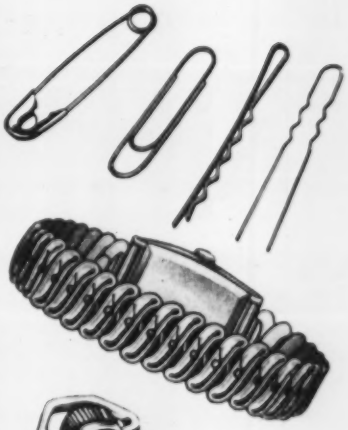


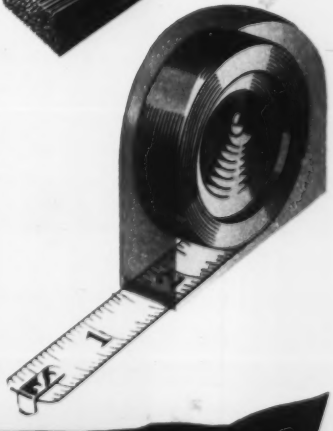
• The many and varied applications of National-Standard special-purpose steel are practically unlimited. Every day, new products and new manufacturing methods are developed that more than ever demand the precise control, high quality and uniformity that only National-Standard specialization offers.

Here we produce steel, wire and strip, to meet unusually severe specifications and are constantly developing special types for new uses. Glad to cooperate with you in best meeting your needs, National-Standard offers an enviable 48-year record of supplying outstanding material, workmanship and service to end-use manufacturers.

For additional information or engineering assistance, write to the appropriate National-Standard Division listed below.







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let us take a closer look at your

"difficult to solve"

Problems Involving Tubing and Solids of Special Alloys and Cross-Sections

Two years of experimental production and several thousand tons of finished extruded products have given B&W a background that can be put to work for you in solving problems involving tubing and solids of special alloys and cross-sections. Through extrusion at B&W:

1. *New alloys have become commercially available as seamless tubing.* These include certain proprietary alloys and various types of ferrous alloys which have been known previously as non-pierceable materials.
2. *Tubing having certain special shaped cross-sections has been produced commercially.* This includes tubing having inside and outside shapes which are independent of each other, such as circular OD—finned—ID, used to solve special heat transfer problems.
3. *Solids having special shaped cross-sections have been produced.* These include shapes difficult or impossible to produce as rolled sections.

Through extrusion, Mr. Tubes, your local B&W Tubing Representative, has helped others to solve problems involving tubing and solids of special materials and cross-sections. Call on him if you have such problems; chances are he will be able to help you.

TA-4031(X)

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W SEAMLESS and WELDED TUBES

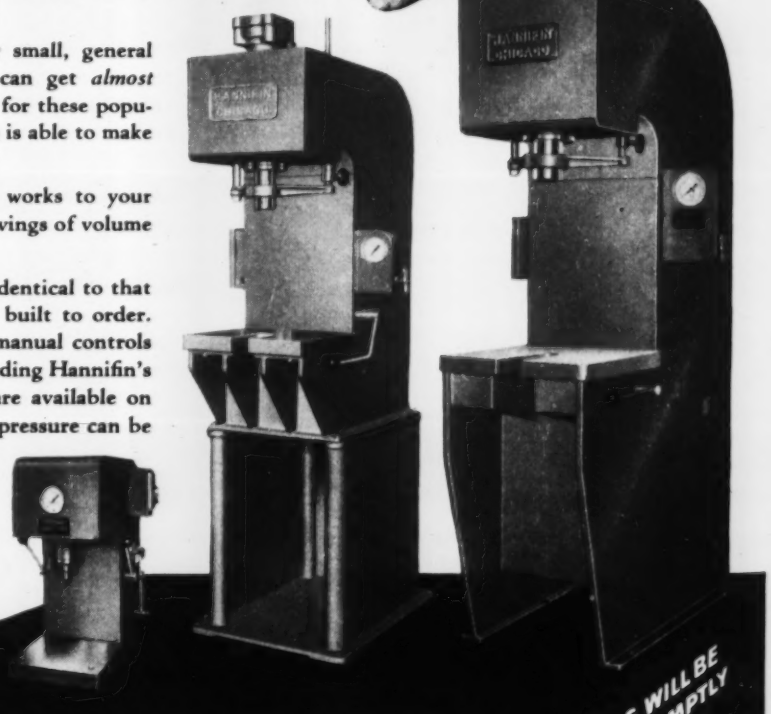
"where can I get a good, small general purpose hydraulic press . . . *quickly?*"

"HANNIFIN HAS THEM FROM 1 TO 10 TONS FOR PROMPT DELIVERY!"

Yes, Hannifin is your best source for small, general purpose hydraulic presses. And, you can get *almost* immediate delivery because the demand for these popular presses is so consistent that Hannifin is able to make them in quantity.

This *continuous* quantity production works to your advantage price-wise, too, because the savings of volume production are passed along.

The quality of these small presses is identical to that of the larger Hannifin presses that are built to order. Fast acting, single-lever and dual-lever manual controls are standard, but optional controls, including Hannifin's patented Sensitive Pressure Controls, are available on the 5-, 8- and 10-ton models. Maximum pressure can be adjusted from 10% of capacity to full capacity on all models.



select the press you need from this chart...

CAPACITY, tons	1-ton	2-ton	5-ton	8-ton	10-ton
MODEL NUMBER	F-10	F-20	F-50	F-80	F-101
RAM SPEED (in.-min.) Down	400	190	120*	73*	130
RAM SPEED (in.-min.) Up	800	345	240*	151*	254
PUMP (gpm.)	3.3	3.3	5*	5*	11
MOTOR (hp)	1½	1½	2*	2*	5
STROKE (in.)	6	6	10	10	12
GAP (in.)	10	10	16	16	22
REACH (in.)	6	6	7½	7½	10
BULLETIN	H-784	H-784	135	135	134

Supplied with larger motor and pump when higher ram speed is required.

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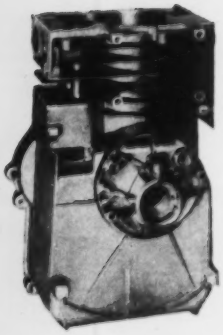
BRIGGS & STRATTON CORPORATION

1,000,000 INDUSTRIAL ENGINES

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

With holding furnaces of 20 kW similar to that in the photo above, and melting furnaces of 100 kW, Briggs & Stratton Corp., Milwaukee, Wisc., is getting increased production under cleaner, more satisfactory working conditions than ever before, *and at lower operating costs.*



The intricate die-cast aluminum cylinder shown at the left is one of many produced at the B & S plant from high grade aluminum alloy melted in low-frequency AJAX induction furnaces. In these furnaces *only the metal is heated.* Energy is transmitted to the molten charge without actual contact through the refractory walls. There are no resistors or other parts having a higher temperature than is absolutely necessary for properly melting the charge. Overheating is avoided, and there is practically no oxidation.

The holding furnaces next to the die-casting machines as well as the melting furnaces are automatically controlled at a temperature within ±5°F., holding the metal at the lowest feasible casting temperature. The agitation due to internal electrical stirring in the metal gives the best conditions for holding furnaces, and there is little possibility of sludge formation at the bottom, because this is where the heat is generated.

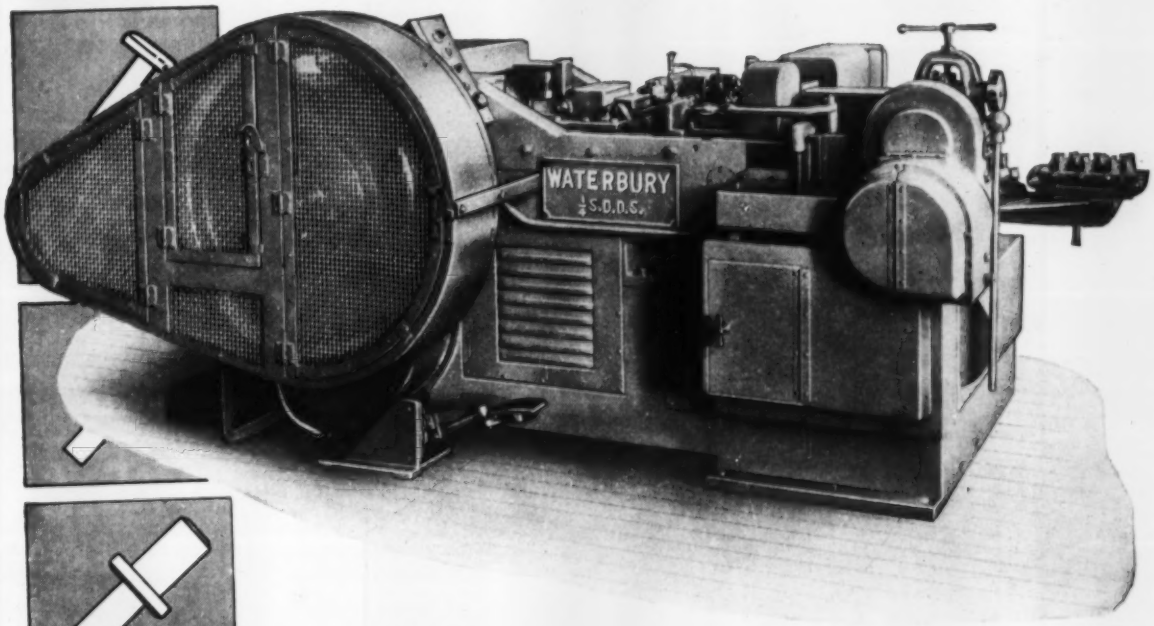
Write for Further Information to

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX TAMA-WYATT = **INDUCTION MELTING FURNACE**

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

HERE'S THE WATERBURY SOLID DIE DOUBLE STROKE HEADER



¼" Capacity . . . Speed, 150 to 200 Headed Blanks per minute . . .

Another High Speed Automatic COLD HEADER of original design . . . The culmination of over 100 years' experience and "know-how" in the design and manufacture of metal-working machinery, pioneering in the development of COLD HEADING EQUIPMENT.

For further information, write, wire or phone —

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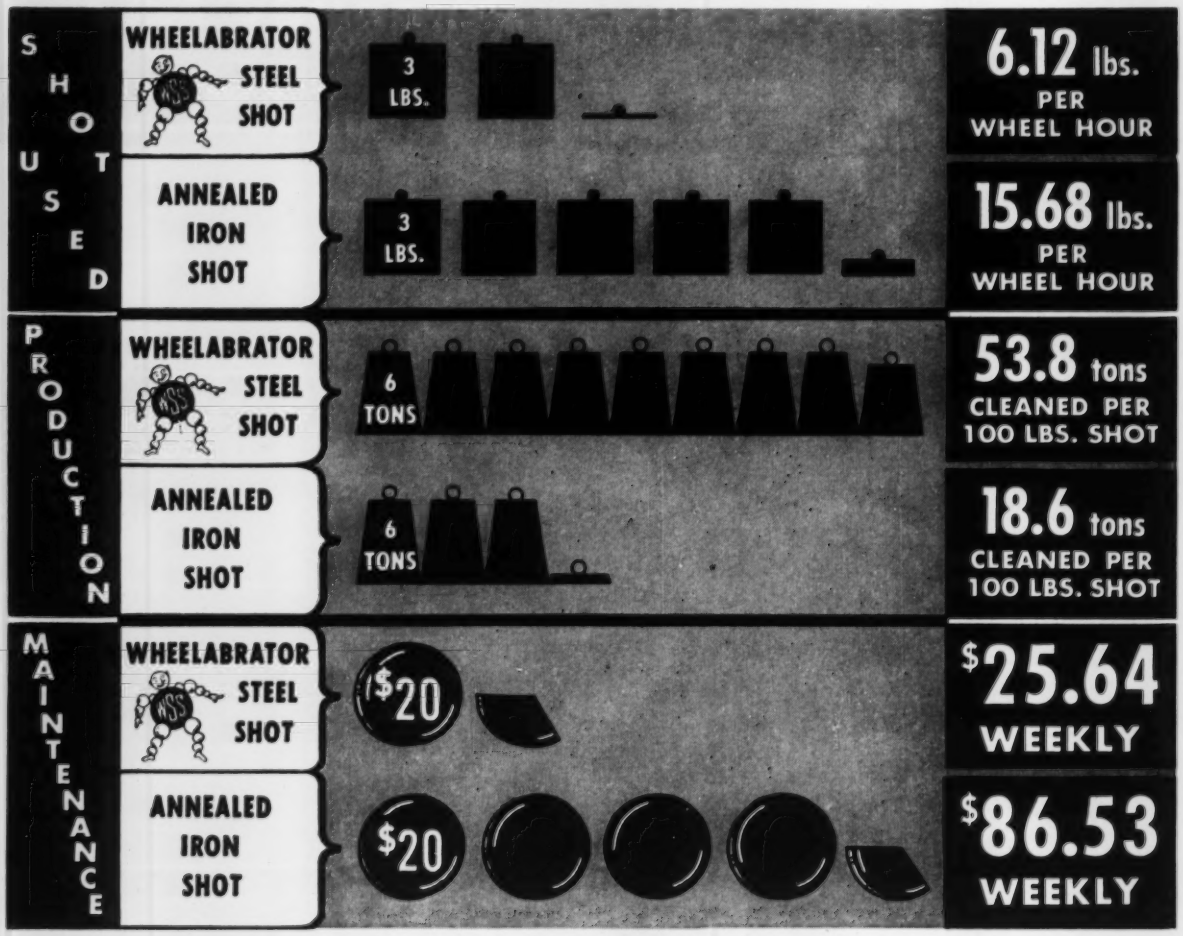
Sales Offices: Chicago, Cleveland, Millburn, N. J.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY FARREL

COLD PROCESS BOLT AND NUT MACHINERY — Headers (all types) · Rivet Machinery · Trimmers · Thread Rolling Machines · Slotters · Nut Formers and Tappers, etc. POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses · Eyelet Machines · Multiple Plunger Presses · Horizontal and Hydraulic Presses, etc. MILL MACHINERY — Rolling Mills: Strip, Rod, Wire Flattening (For Ferrous and Non Ferrous Metals) · Also Slitters · Straighteners · Cut-off Saws · Coilers · Winders, etc. WIRE MILL EQUIPMENT — Continuous Wire Drawing Machines (Upright Cone and Tandem) · Wire Flattening Mills · Chain Draw Benches · Pointers · Swagers · Bull Blocks · String-up Machines · Spoolers, etc

pioneering developments keep WHEELABRATOR® STEEL SHOT first in abrasives



How Gunite Foundries Corp. Saves

with Wheelabrator Steel Shot

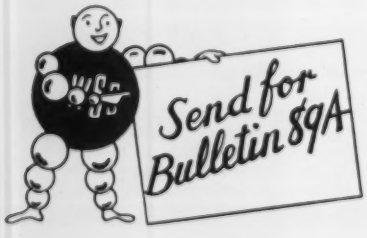
Gunite Foundries Corp., Rockford, Illinois wisely switched to Wheelabrator Steel Shot for cleaning semi-steel castings in their Wheelabrator blast cleaning machine. They discovered this superior electric furnace steel shot came out on top on every count compared to the annealed iron shot previously used. As illustrated in the chart above, important savings were realized in abrasive consumption, increased production and decreased maintenance. In addition, Gunite found a noticeable improvement in the cleanliness and surface appearance of their castings.

Every day more and more foundries of every type are switching to Wheelabrator Steel Shot. The reason is obvious: Performance records in these plants prove convincingly that the lowest overall cleaning costs are achieved with Wheelabrator Steel Shot.

Combining hardness with toughness, this superior shot will clean or peen faster, at lower costs, than any other abrasive. Try it and prove it for yourself.

PLUS

50 lb. Cartons and Palletizing. A Scheduled Delivery Plan.



American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Ind.

behind the 8 ball... need help?

Call your nearest

J&L STEEL WAREHOUSE

for a complete line of steels

SPECIALS: Jalloy (Abrasion and Impact Resistance) Jalten (High Strength—Good Formability—Lighter Weight) Junior Beams • Junior Channels • Jaltread Floor Plate • Tool Steels • Stainless Steels.

STANDARD PRODUCTS: Hot Rolled and Cold Finished Bars and Shapes. Structural Shapes • Carbon and Hi-Tensile Plates • Hot and Cold Rolled Strip and Sheets • Wire Products • "Precisionbilt" Wire Rope.

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TECHNICAL SERVICE: Experienced J&L Metallurgists to help you with analyses and recommendations.

FABRICATION SERVICE: Shearing, forming, torch cutting, blanking, to your specifications.

J&L STEEL

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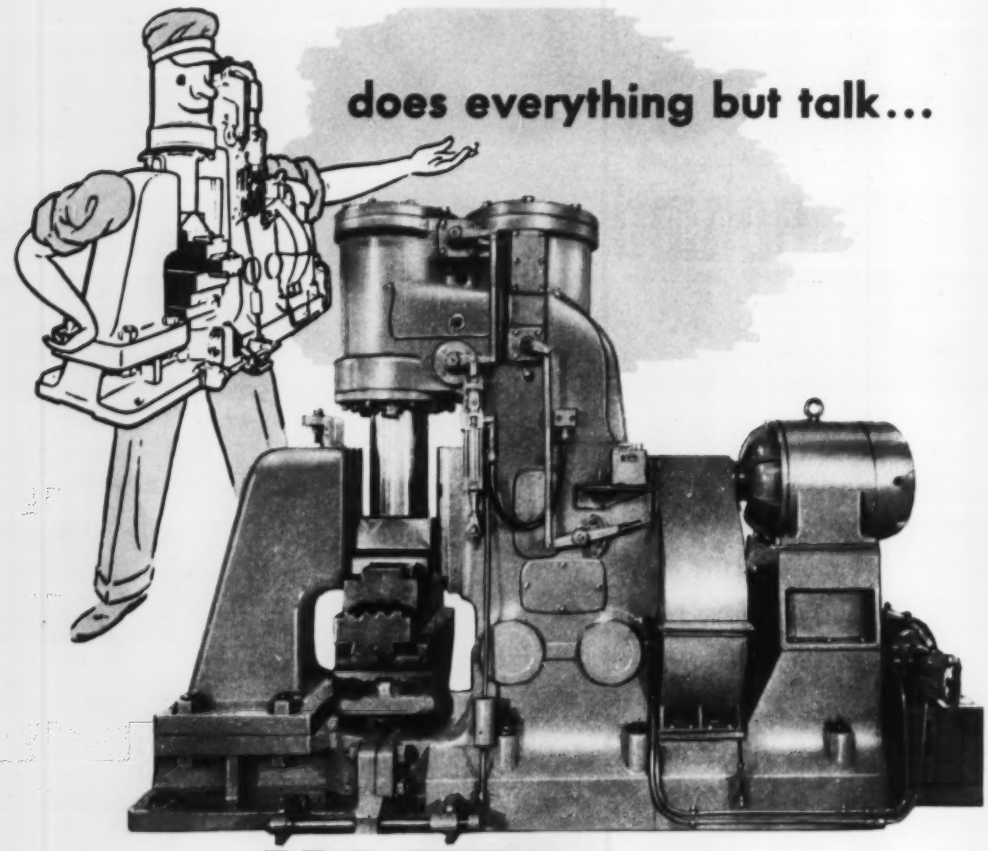


does everything but talk...

this new NAZEL ELECTRO-PNEUMATIC No. 6 "TYPE C" forging hammer

just look at these features!

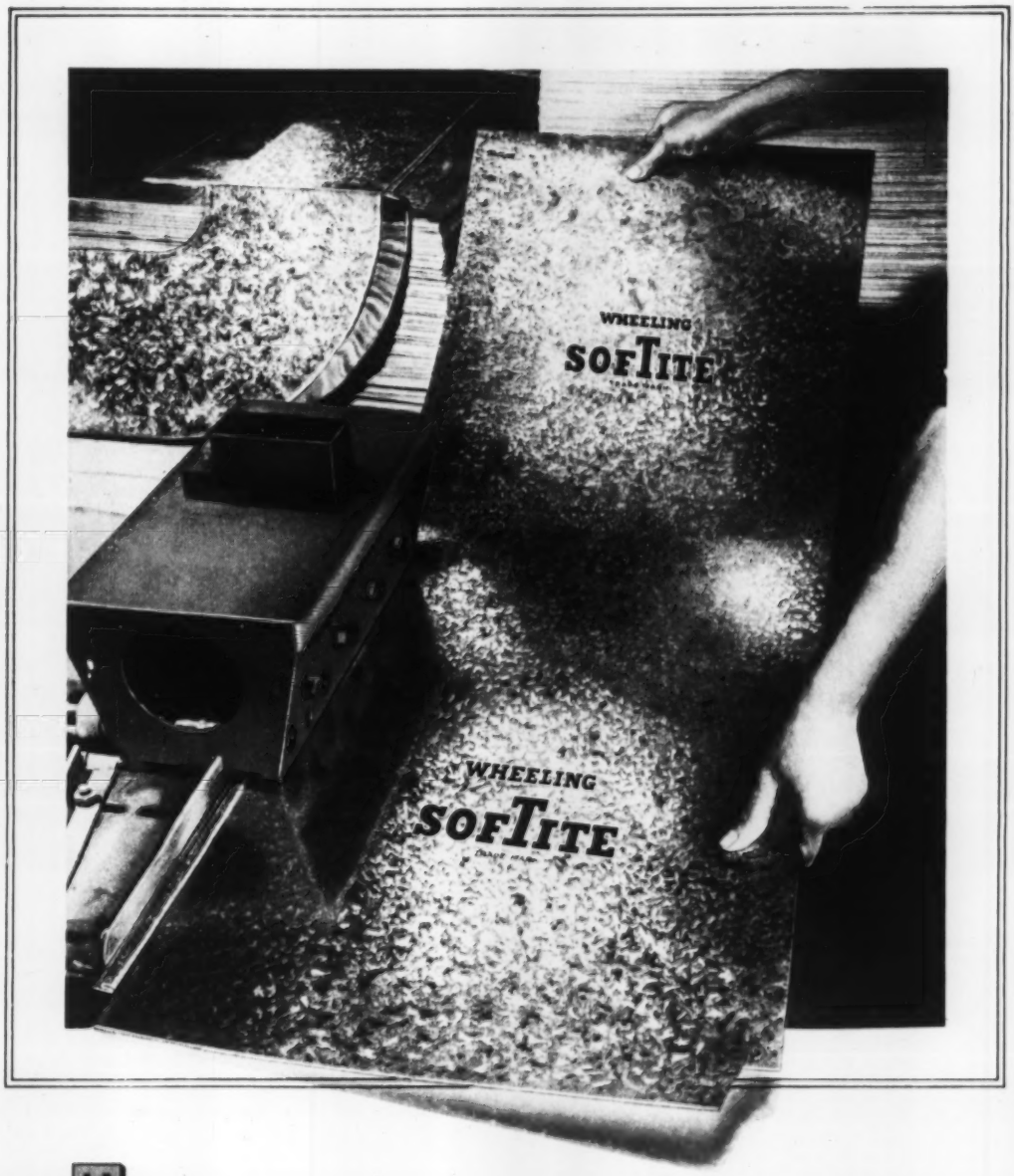
- Outboard Ram Guide, which allows both open and closed die forging and insures positive die mating . . . Anvil is mated to base for exact register.
- Die capacity is exceptionally large. Upper die shown is 14" by 40" by 7".
- Hydraulic Power Control . . . gives "feather touch" treadle or hand control changeable or removable for convenience.
- Light to heavy blow at touch of Control to suit job. Coining, planishing or forging.
- Direct Power Drive, with pinion running in oil for longer life.
- Modern Lubrication to *all* moving parts.
- Completely self-contained!
- This new NAZEL No. 6 "Type-C" is a floating ram hammer at its best . . . designed for continuous production, proper forging ratio . . . and, it is *economical!*

Further details are yours upon request.

1836

LOBDELL UNITED COMPANY
WILMINGTON 99, DELAWARE
A SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY

1954



SOFTITE GALVANIZED SHEETS ARE NEW—DIFFERENT!

● *New* because it was developed and perfected by Wheeling engineers after years of research and experiment. Manufactured by a new process covered by U. S. Patent No. 2,647,305. *Different* because it combines a soft, ductile steel base with an incomparably tight zinc coating.

Ductile and tight coated to a most amazing degree, Wheeling SofTite Galvanized Sheets form freely and easily, without the customary distortion by strains in the zinc coating which cause separation of coating from the base metal. It permits every fabricating operation without flaking or chipping of coating.

Actual users have acclaimed Wheeling SofTite the ultimate in continuously coated galvanized sheets.

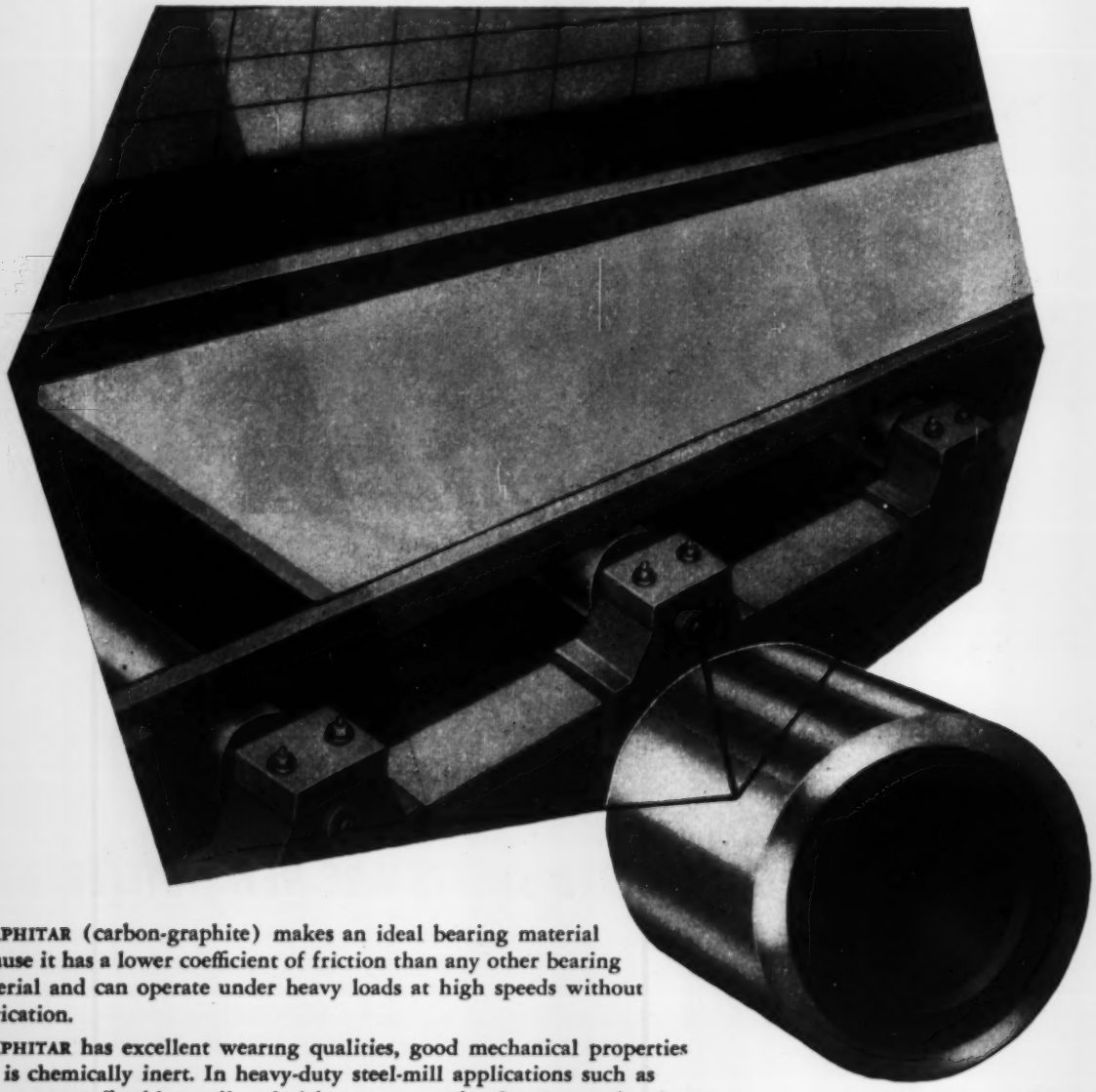
Working sample available. Call or write nearest warehouse or office. Wheeling Steel Corporation, Wheeling, West Virginia.

IT'S WHEELING STEEL!

GRAPHITAR®

METAL-BACKED BEARINGS FOR THE STEEL INDUSTRY

Metal-backed GRAPHITAR bearings provide exceptional strength and durability for long life in difficult steel mill applications



GRAPHITAR (carbon-graphite) makes an ideal bearing material because it has a lower coefficient of friction than any other bearing material and can operate under heavy loads at high speeds without lubrication.

GRAPHITAR has excellent wearing qualities, good mechanical properties and is chemically inert. In heavy-duty steel-mill applications such as shear or cut-off tables, coil and slab conveyors, the GRAPHITAR bearings are metal-backed to provide additional strength and resistance to shock. GRAPHITAR metal-backed bearings can be supplied in tolerances as close as .0005" ready for installation.

183

OUR 100th YEAR

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN

Roebling drum packs are shipped on pallets unless otherwise specified. This gives you today's easiest, least expensive method of moving and stacking wire – with a fork truck, one man can do the work of ten.

Packed to save you money!

IN ADDITION to producing top quality high carbon wire, Roebling has developed many special methods of packing ...and some *one* of these, or some other method which may be developed for your specific requirements, may save a considerable amount of time and money in your plant.

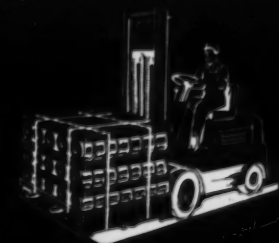
Certain types of wire, for instance, can be packed in hexagonal fibre drum packs that provide superior protection and facilitate handling and storing wire. Drum packs do not have to be returned...save you bother, storage space and freight charges.

You *pay* for the best when you buy high carbon wire. Make sure you *get* the best, in wire and packing too. Always specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.



If you wish, Roebling spools will be delivered on pallets with separators, providing the easiest and most economical means of handling and stacking wire with fork truck.

GEARS, BEARINGS LAST LONGER

WHEN you use *Texaco Meropa Lubricant*, you add materially to the life of your enclosed reduction gears and bearings—assure smoother, quieter operation and bring down your maintenance costs.

Texaco Meropa Lubricant has improved EP characteristics that are not affected by high operating temperatures. Thus the increased protection you get lasts longer. *Texaco Meropa Lubricant* does not separate in service, storage or centrifuging, does not thicken or foam. Its adhesiveness is not affected by moisture and it is non-corrosive to bearings.

For oil film bearings on roll necks, use turbine-quality *Texaco Regal Oil*. It has outstanding resistance to oxidation and sludging, gives outstanding protection.

Let a Texaco Lubrication Engineer help you. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

STEEL
June 14, 1954

Metalworking Outlook

Rougher Road for Unions

Labor chiefs are finding the going rougher this year than last at the bargaining tables. In the Cleveland area, often considered a barometer for the country because of the diversity of industry there, the average increase thus far in 1954 is 6.07 cents per hour, somewhat below the average gain of 8.32 cents in early 1953 negotiations. Of the 1954 settlements, reports Associated Industries of Cleveland, few companies have granted or increased fringe benefits in addition to a wage adjustment.

Big Month for Labor

The average increase may be higher for the rest of the year because several pattern-setting settlements may be made this month. And those contracts promise to cost more than 6 cents. As of late last week General Electric Co. had reached no agreement with the two major electrical unions on an offer of an average 5-cent boost. United Rubber Workers, CIO, brings negotiations with the four largest rubber companies to a climax this month with demands for "substantial" pay hikes. The steel industry and the steelworkers' union resume talks in the most important parley of all. Steelworker President David J. McDonald's demands cover 15 double-spaced pages and include everything from the guaranteed annual wage (to be financed by a trust fund of 4 per cent of the company payroll) to two additional holidays. The cost would be at least 50 cents an hour.

Congress Looks at Welfare Funds

Tired of the Army-McCarthy hearings? Two new Congressional investigations are coming up that should result in more conclusive findings. Sen. Irving Ives (Rep., N. Y.) heads a Senate labor subcommittee that will study all private welfare programs, estimated to be worth some $30 billion. Rep. Samuel K. McConnell Jr. (Rep., Pa.) heads a House group which will investigate alleged corrupt practices by unions in handling welfare funds.

Capital Outlays Slip a Little

Industry will continue to cut its new plant and equipment spending through the third quarter of this year. Even so, high outlays will still bolster the economy. The Commerce department and the Securities & Exchange Commission say capital expenditures, at annual rates, will hit $26.9 billion in the quarter that ends this month and will drop to $26.8 billion in the July-September period. The first-quarter rate was $27.5 billion. The two agencies predict that total 1954 capital spending will reach $27.2 billion, down only $1.2 billion from the record $28.4 billion spent last year.

Atomic Power by 1975?

Chances are good that by 1975 some of the electric power you will be using will be generated by atomic energy. Walker L. Cisler, president of De-

The Technical Outlook—p. 109 The Market Outlook—p. 155

troit Edison Co., predicts that up to 65 million kilowatts will be generated that way 21 years from now.

Industrial Fires Rage

Fire losses were up 6.1 per cent in 1953 over 1952 because of greater industrial damage. Big industrial fires accounted for 25 per cent of last year's record $1-billion loss in the U.S. and Canada. Damages resulting from such fires were up 50 per cent over 1952. The National Board of Fire Underwriters attributes the trend to the greater use of hazardous and complex industrial processes.

Laboring Population To Shift

The ratio of the U.S. labor force to the total population will be about 14 per cent less by 1963, causing a shortage of labor and accenting the need for both industrial and agricultural mechanization. Those are the conclusions of Steven P. J. Wood, president of Warner Electric Brake & Clutch Co., Beloit, Wis. He says our total population will reach about 177 million by 1963, but "this group will be mainly in the 14 to 17 year age group which will be about 50 per cent higher than it is today."

Register for Key Technologists

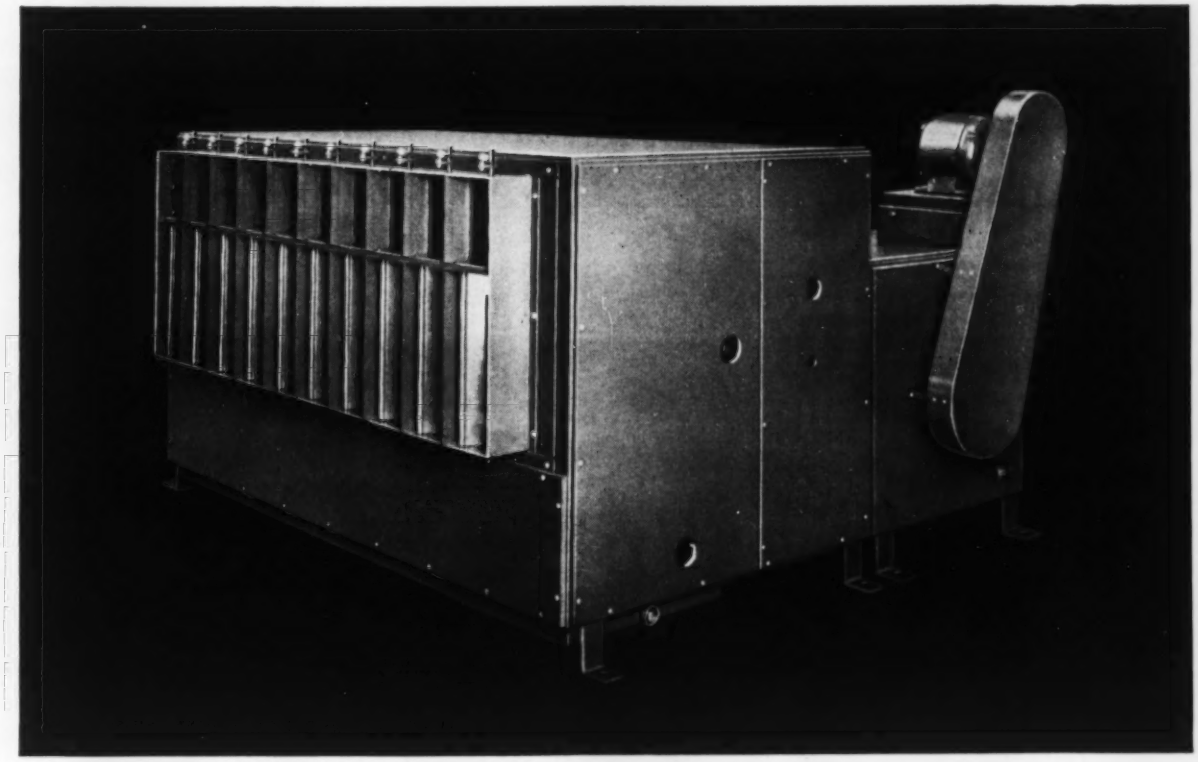
First steps are coming to set up a national register of technologists. National Science Foundation has selected Engineers Joint Council to compile a national register of engineers for reference purposes in case of an emergency. The register will be limited to about 20,000 leaders in all the engineering fields. NSF has picked American Chemical Society to compile a similar register of chemists.

Straws in the Wind

U.S. Steel Corp. and the United Steelworkers of America have made "tremendous strides" in cementing their relations as a result of goodwill plant tours by their top officials, the union reports . . . Roger M. Kyes, former deputy secretary of Defense, has rejoined General Motors Corp. as vice president in charge of the Dayton and Household Appliance Divisions and the GMC Truck & Coach Division . . . The Supreme Court gave the New York State Power Authority final clearance for a $600-million hydroelectric project on the St. Lawrence; the action also clears the way for beginning construction on the seaway . . . Cone Automatic Machine Co. Inc., Windsor, Vt., is establishing a wholly owned subsidiary, Cone Automatic Machine Co. (Great Britain) Ltd., at Solihull, England, for manufacture of Cone machines for the sterling area and other parts of the world.

This Week in Metalworking

The downtrend in manufacturers' consumer durable inventories should end by fall (p. 67) . . . Defense contract obligations are rising (p. 68) . . . Lake shipbuilders are turning to nonshipbuilding work as the lean years start (p. 70) . . . The road ahead is rough for freight car builders (p. 71) . . . Republic Steel Corp. continues its program of diversification by purchase of facilities to produce chain (p. 72).



Now...A Westinghouse Multi-Zone Unit Automatically Conditions Air— Up to 12 Independent Zone Areas

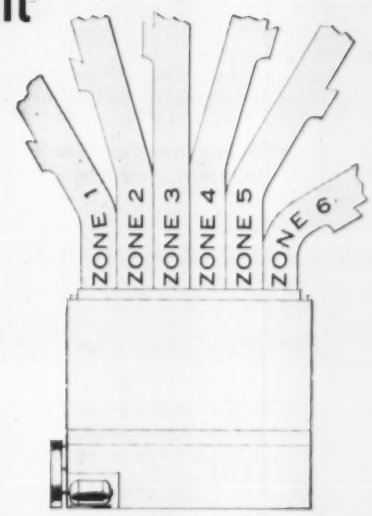
This rugged, compact central plant air conditioning unit supplies air, conditioned for simultaneous unequal heat load demands, in various zones requiring individual temperature and humidity control.

Formerly, heat load variations caused by differences in building construction, changes in occupancy, wind or solar exposure, could be controlled only by separate supply systems for each zone or by expensive zone reheat arrangements.

Now . . . this problem can be solved with a single Westinghouse Multi-Zone Air Conditioning Unit. Efficient . . . economical . . . this versatile unit supplies air—conditioned at a central location—for the individual needs of as many as 12 zones.

This complete unit—fans, coils, motors and starters—is designed and manufactured by Westinghouse, permitting a single equipment warranty with undivided responsibility . . . an exclusive feature in all Westinghouse Air Handling Units.

For complete information about this outstanding advance in central plant air conditioning, call your nearest Sturtevant Sales Engineer today. Or write: Westinghouse Electric Corporation, Sturtevant Division, Boston 36, Mass.



TOP VIEW
(FOR SIX ZONES)

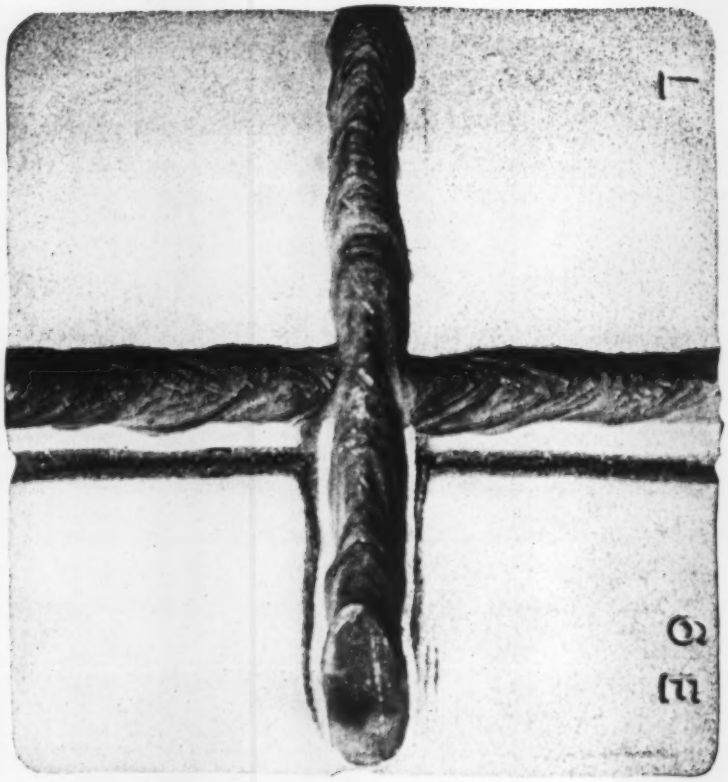
Multi-Zone Units are of the blow-through type with divided outlets to serve multiple zones by supplying heated or cooled air, or controlled mixtures of both, to each zone.

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE...IF IT'S Westinghouse

J-80393

HOW ARMCO "ELC" STAINLESS CUTS COSTS IN WELDED EQUIPMENT



The effect of 6-hour immersion in a hot solution of 10% nitric acid and 3% hydrofluoric acid. On the upper portion of the sample (Armco 18-8 ELC), there is no evidence of chemical attack adjacent to the weld. The lower portion (Armco 18-8), shows severe attack and perforation. Electrode was Type 308L.

Are you buying the premium-priced stainless steel grades, Types 321 and 347? If it's simply a welding problem and the equipment operates at less than 800 F, here's how you can reduce costs.

Armco produces two extra-low-carbon (ELC) stainless steels that are completely satisfactory for service in welded equipment up to 800 F. They are:

Armco 18-8 ELC (Type 304L)
Armco 18-12 Mo ELC (Type 316L)

Armco 18-8 ELC costs less than the columbium-stabilized Type 347 or the titanium-stabilized Type 321, yet insures the same freedom from intergranular corrosion in service below 800 F as the more expensive types. The Armco ELC types are produced in sheets, strip, plates, bars and wire.

"EXTRA-LOW-CARBON" DOES IT

Armco ELC grades contain *a maximum of only 0.03 per cent carbon*. This small amount of carbon is not enough to cause harmful carbide precipitation adjacent to welds during welding. Stabilizing elements are not needed, either for shop or field welding.

GET COMPLETE INFORMATION

Let us send you a copy of the booklet, "Armco's ELC Stainless Steels." Or, if you want technical information for your engineers we'll send you a copy of the article, "How to Control Carbide Precipitation in Welding Stainless Steels." Just fill in the coupon and mail to us.

OTHER SPECIAL ARMCO STEELS

Besides stainless steels, Armco is a major producer of Cold-Rolled Sheets and Strip, Enameling Iron, Electrical Steels, and sole producer of ALUMINIZED Steel, ZINCGRIP and ZINCGRIP PAINTGRIP Steel sheets and coils.

ARMCO STEEL CORPORATION
3044 Curtis Street, Middletown, Ohio

☐ Send me a copy of the booklet, "Armco's ELC Stainless Steels"

☐ Send me a copy of the article, "How to Control Carbide Precipitation in Welding Stainless Steels"

*Send me information on these other Armco steels*_____

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ARMCO

Self-Mobilization

Like most of us, you probably have been trying to figure out whether and when the hot war is likely to break out. Nobody, including Washington, can set the date for M-Day. Let's hope there never is one, but it would be well to plan—just in case.

It looks as though planning is for continued peace. The administration is considering further tax reductions and operating economies. So far, there's no evidence of a war-inspired speed-up in defense spending.

But, we are concentrating on development of new weapons. Our European defenses are building up slowly but surely. A defense community also is being marshalled in the Far East. Our fleet stands in readiness for what might happen in Indo-China. This is in case Red China steps in and the lid blows off.

As part of the planning, the National Labor-Management Manpower Policy Committee can come out with a full mobilization plan. It bases its recommendations on these considerations:

1. The ultimate limiting factor in war is the maximum labor force, including the armed services, that can be assembled at its highest degree of effectiveness.
2. It is recognized that an enemy can successfully attack the U. S. on a scale that would result in widespread destruction or damage to industry and millions of human casualties.
3. A broad program of economic controls will be instituted promptly after M-Day, as needed.

If controls return, it means allocation of materials and freezing of prices and manpower. There's no point in stocking up excessively on materials that might find little use if M-Day comes. But, it could pay off to do these things:

Check equipment replacements and additions. See whether employee training should be intensified. Find out whether selling prices are in line with costs. Remember, how many companies got stuck in the last freeze? Contact government procurements agencies to see what you could make. Requirements are changing fast since World War II and Korea.

The situation is critical enough to call for an adequate measure of self-mobilization on behalf of your organization, your employees and your country.

Irwin H. Such

EDITOR

YOU CAN HELP: If you think that spending 6 months in Washington on a government job is a complete waste of time, you're likely to be pleasantly disillusioned if you try it.

We're speaking, of course, about such government groups as the Business & Defense Services Administration of the Department of Commerce. Its 25 divisions need a corps of experi-

enced executives who can work in the best interests of both industry and the defense program.

If you take a Washington job, you're a WOC. This means that you don't get paid unless your company keeps you on the payroll. There are plenty of disadvantages, like being away from your family and your job. There are the pressures from legislators and business acquaintances looking for favors and people who want you to attend their cocktail parties because you're important. Then there are the worries of making quick decisions involving millions and the boredom of endless conferences.

But, you can go home at the end of six months knowing that you've done a job for your country; that you know a lot more about the inner workings of the government that will be of immeasurable value to your company in dealing with it. Right now, the advantages of being a WOC are well worth considering (p. 73).

* * *

UPTURN IN STEEL? There's a lift in steelmaking that may turn out to be one of the first signs of better business expected in second half of 1954.

At 73 per cent of capacity last week, the steel industry made 1.74 million tons of steel. It's the largest tonnage since the week of Feb. 22 and is further evidence of the uptrend that has been taking place for several weeks (see chart p. 155) and quite contrary to the downswing at this time last year.

In the first five months the industry made 36.8 million tons, off 24 per cent from the 48.5 million tons made in the 1953 period. That's not an accurate picture of the decline in metalworking since many companies have been working off excess inventories, an adjustment believed nearing its end.

Wage negotiations have stimulated a little scare buying but not too much. We are witnessing some solid recovery that may become more apparent as we move into early fall.

* * *

TRAVELING STOCKROOM: If you're looking for ways to reduce handling and assembly costs, perhaps Eastman Kodak has an idea for you!

In 1946, Eastman engineers designed what employees now fondly call a "Carrousel." It's an overhead chain conveyor system that travels within arm's reach of the workers in the department assembling Brownie cameras. Trays tiered up to six high on each carrier convey individual parts and subassemblies to workers at assembly benches. Workers simply remove trays with the work to which they are assigned. If they miss one tray, they know another will be along in a minute.

The first conveyor paid for itself so quickly that Eastman has installed five more to handle other camera models and accessories (p. 110).

* * *

BIGGER FORGINGS: One of the benefits arising from the Air Force heavy press program is the development of still larger aluminum forgings.

For the last several years, Kaiser Aluminum & Chemical Corp. researchers (p. 138) have been working on methods for pouring sound aluminum alloy ingots for making large aircraft forgings. And, seven ingots 32 inches in diameter by 70 inches in length shipped to U.S. Steel's Homestead Works for experimental forging on a 7000-ton hydraulic press met their expectations.

The 5000-pound ingots were small in comparison with steel ingots up to 200 tons ordinarily handled on the press. However, greater resistance of aluminum to deformation confirmed the fact that much heavier presses are needed for the economical production of large aluminum forgings.

Testing of slices taken from the ingots and complete internal inspection by ultrasonic reflectoscope revealed no cracks, segregation or porosity. Larger forgings thus are on the way for superfighters and intercontinental bombers. Imaginative designers and engineers will see numerous applications for them in industrial products.

* * *

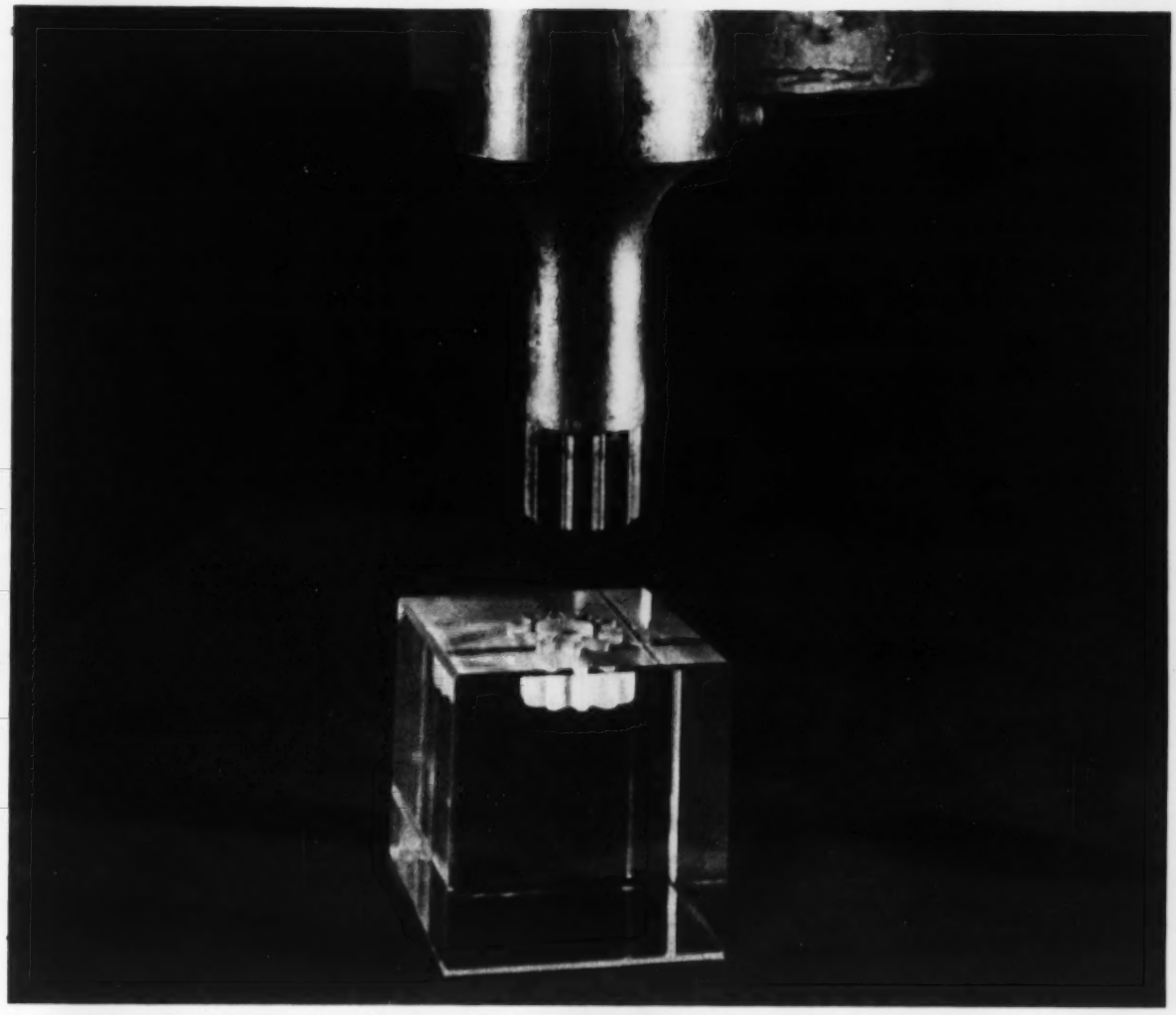
BOOM IN PLASTICS: Visitors to the plastics show in Cleveland last week were impressed by the virility of this booming industry.

In 1953 it sold a record 3 billion pounds of materials worth $1.5 billion. This year, 1953 will be topped by 5 per cent.

The plastics folks think their products will find lots of uses when the economics are right, but they don't expect to take over the market dominated by metals. It costs $500,000 to tool up for a plastic sports car body, $4.5 million for a steel body. But when production goes over 15,000 units, it's cheaper to use steel.

Many think plastics and the metals will compete intensely for some applications. They also feel the two types of materials will contribute to each other's growth.

(Advertisement)



Using high-frequency vibrations and low-cost abrasives, the Ultrasonic Machine Tool carves holes and patterns of all shapes in hard-to-work materials. Development of the tool climaxed more than 10 years of research and experimental work.

How SILENT SOUNDS CUT HOLES you can't drill

This common steel gear bites its way into a glass cube as smoothly as it would mesh with its mate.

And that's *something*, for chiseling through glass is quite a trick, even with a tool designed for the job.

Yet, as you can see, it's being done right here. And the machine that does it can also sharpen the hard metal tools used to cut other metals. It can cut diamonds without the use of diamond powder. Some day, it may even eliminate the heat-generated pain caused by your dentist's whirling drill, or provide a vastly improved method for breaking up kidney- and gallstones.

Now how does this revolutionary tool work? *By ultrasonic vibration.* It vibrates 27,000 times a second! Every vibration pounds waterborne abrasive against the surface you're cutting, and steadily chisels away tiny particles.

It took time to produce and control these vibrations. Over 10 years of research and trial-and-error experimentation! Then—with the help of Inco Nickel — the successful method was perfected.

Pure nickel, when placed in an electromagnetic field, contracts much more than other commercial metals, and returns to its original length. (Physicists call this "magnetostriction.") It is this motion — stepped up a hundredfold — that produces the vibrations which give the tool its bite.

There are many similar useful qualities found in Inco Nickel Alloys. Between them, pure nickel and Monel provided the key to the problems of the ultrasonic machine tool. Another of our metals may help to open a door now locked to you. Let's get together and work out that problem of *yours* — soon.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Inco Nickel Alloys

Monel® • "R"® Monel • "K"® Monel "KR"® Monel • "S"® Monel • Inconel® Inconel "X"® • Inconel "W"® • Incoloy® Nimonic® Alloys • Nickel • Low Carbon Nickel • Duranickel®

INCO

will your suppliers carry you... *if trouble comes?*

No one can tell when adversity may strike —it could be a fire, a national emergency or an industry slump. Most of us tend toward the bright side and don't often think of the importance of financial or technical aid as a consideration when choosing a supplier. But most men of experience agree that it is important to do business with firms that not only have the interest but the ability to carry you in an emergency.

On no less than two occasions—the Great Chicago Fire and the Panic of 1893 —our own company would have been out of business had it not been for the cooperation of our sources of supply. So, we speak from experience when we attest to the value of good dependable sources. They may mean the difference between success and failure.

The Ryerson Company, through over 100 years of business, has been privileged to help many firms when the going was rough. So, whether it is just steel in a hurry or help when it counts most, call on Ryerson. You will not be disappointed.

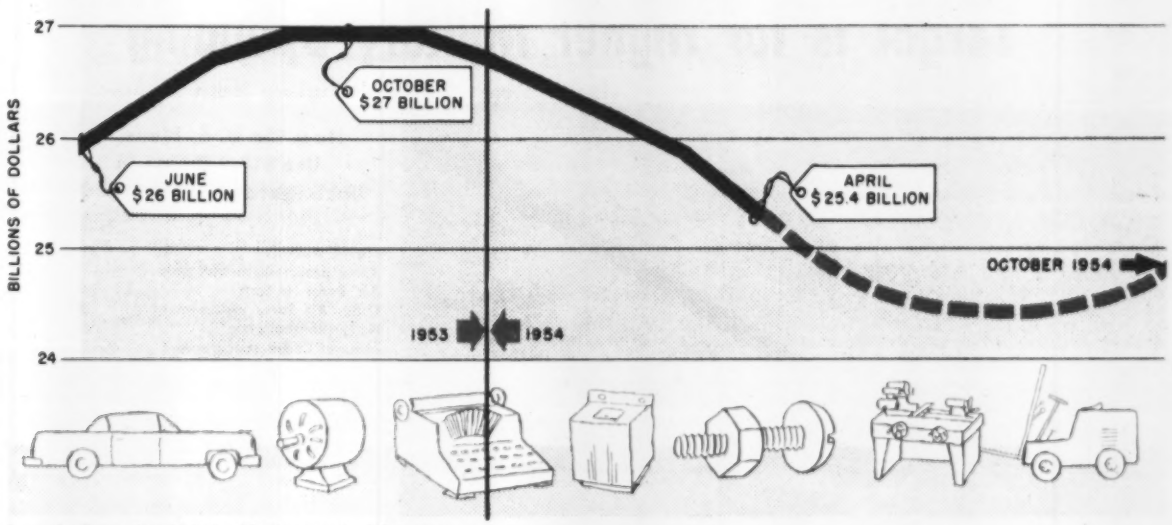
PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished
ALLOYS—Hot rolled, cold finished, heat treated
STRUCTURALS—Channels, angles, beams, etc.
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
PLATES—Many types including Inland 4-Way Safety Plate
REINFORCING—Bars & Accessories, spirals, wire mesh
SHEETS—Hot & cold rolled, many types & coatings
BABBITT—Five types, also Ryertex plastic bearings
TUBING—Seamless & welded, mechanical & boiler tubes
MACHINERY & TOOLS—For metal fabrication

RYERSON CERTIFIED STEELS

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



Source for figures through April, 1954: Department of Commerce. Data as of end of each month.

Manufacturers' Durable Goods Inventories:

Downtrend Will End by Fall

LOOK FOR a reversal by this fall in the current downtrend in manufacturers' durable goods inventories.

April stocks skidded to $25.4 billion from the $25.9 billion at the end of March (see the chart). Inventories are probably even lower now, may bottom at about $24.5 billion by July or August and stay at that level until around October when you can expect them to climb moderately. The shakeout in all manufacturers' stocks will follow about the same pattern, although the upturn may take a month or two longer to come. All manufacturers' inventories slid to $45.3 billion in April, down nearly $500 million from March.

The Reason Why—Three major factors will account for the expected climb in durable goods stocks: A moderate upturn in civilian business; the strong probability that the present inventory-cutting will result in spot-shortages in stocks that will need correcting by fall; and increased defense ordering (for details on that see p. 68). The increased defense work does not stem from calculations of heavy needs in case we become directly involved in Indo-China or any other "little" wars. If we do get into a fighting war, inventories will rise sharply almost immediately.

A spot check of metalworking executives by STEEL shows that they expect their sales will be 10 per cent greater in the second half than in the first six months. When business rises, inventory increases almost invariably follow. Already some buyers are worried about stock imbalances. A slight gain in inventories reported to the Purchasing Agents Association of Chicago for May can be largely attributed to purchases to achieve balance.

A Parallel?—This inventory shakeout is markedly different from the 1949 recession. Then durable goods stocks hit a high of $16.0 billion in February, 1949, then 11 months later in November, 1949, had dropped 17.5 per cent to the low of $13.2 billion. This time durable inventories hit a high of $27.0 billion last October. In the six months since then for which figures are available, the decline has been only 5.9 per cent. If STEEL's estimate of a $24.5 billion bottom in durable stocks is correct, the total slide will be only 9.4 per cent. However, if we do not get directly involved in a fighting war, the upturn will take a little longer to come than in the 1949 shakeout.

Some economists have called the present business downturn almost totally due to this inventory shakeout. That's not true. Stocks of manufacturers' durable goods in April are still 58.7 per cent above the 1949 peak. The present 10-per-cent decline in business from 1953 levels has occurred while the economy catches its breath and adjusts to what everyone hopes will be predominantly a civilian economy. That has caused the inventory declines. The mild stocks upturn anticipated for this fall is a sign that the economy is getting its second wind.

Target Is for Higher Military Spending

Chrysler Corp.

How the U. S. Plans To Use $13.9 Billion in Unobligated Defense Funds

	millions
Naval Aircraft	$922
Army procurement and production	1300
Air Force aircraft	3800
Other Air Force procurement	1000
Navy shipbuilding	400
Marine Corps procurement	200
Army military construction	470
Navy military construction	215
Air Force military construction	1200
Miscellaneous, including maintenance, operation, military personnel costs, research and development	4393

MILITARY procurement is being stepped up. Contract obligations will be pushed to between $3.5 billion and $4 billion a month. Of that, orders for hard goods will account for some $1.5 billion to $2 billion monthly.

The over-all rate represents quite a hike from the ordering rate of $2 billion to $2.5 billion monthly for July 1, 1953, to Mar. 31, 1954. It's from $500 million to $1 billion less than the Korean War peak.

Watch Out!—That means an immediate, healthy increase in military ordering, but a longer wait will be necessary for an increase in actual spending. Reason is that deliveries on old contracts have been well above the ordering rate thus far this year. It will take until late 1954 or early 1955 before beefed-up ordering now begins to show in even larger deliveries.

Pentagon officials emphatically deny that increases in military contract obligations have any connection with the war in Indo-China. The current move had its origins last year, they say, when Defense Secretary Charles Wilson ordered the armed services to reduce procurement, use up Korea-built inventories, and review existing contracts to determine which should be renewed, allowed to expire or cancelled. That period ended Mar. 31, 1954.

Keeping Them Busy—Now the armed services are ready to replenish stocks. Also coming to a head is the problem of keeping contractors busy on military orders if they are to continue as military suppliers. The aircraft industry, for example, had a backlog of only $7 billion to $8 billion in military contracts as of last March. That's the equivalent of one year's output.

To open the doors of military buying wider the armed services have $13.9 billion in unobligated funds (as of Apr. 30, 1954) for fiscal 1954. Whether all this money can be obligated by June 30 is questionable. For how it may be spent, see the table above.

Hard Spending—Hard goods ordering has been building up from last July 1. It averaged $172 million monthly and totaled $1,551,000,000 for the nine months to Mar. 31, 1954. May obligations are estimated at about $1 billion, or $829 million above the previous average. June obligations should be about $1.5 billion, or $1.3 billion above the earlier average. From June to October, 1954, the rate should build up to about $1.5 billion to $2 billion a month. What will happen after October is not yet decided.

Dollar spending for hard goods has been much higher than the rate of obligation, however. Due to deliveries on old contracts, spending averaged $1.3 billion monthly and totaled $12.2 billion for the nine months ending Mar. 31, 1954. With the increased tempo of ordering, deliveries of military hard goods will increase to about $1.5 billion. That's some improvement but not a great deal.

Eye on Indo—What is the long-term outlook for military procurement? Pentagon officials answer they can only say the world situation calls for a flexible attitude. Policy could change quickly. The important thing is that the Defense department will be well heeled for any emergency.

Congress is now working on defense appropriations of about $30 billion for fiscal 1955. There's $10.7 billion of DD's fiscal 1954 unobligated funds which the Budget bureau reserved for use in fiscal 1955. Then, there will likely be $4 billion to $5 billion unobligated from the $13.9 billion the armed services had on Apr. 30. Added up, it means the Defense department will have about $45 billion of unobligated funds which it could disburse in fiscal 1955.

There's Metal in Those Plastic Hills

Highlighted at the plastics show in Cleveland last week was the partnership between metals and plastics. Plastics producers need metal equipment, molds, tools

METAL PEOPLE viewing the Sixth National Plastics Exposition at Cleveland this week "to see what the competition is doing" came away feeling they'd found a new friend.

The huge show, which attracted nearly 20,000 from all industry, pointed up the close tie between metals and plastics—plastic people need metal in the form of precise equipment to produce their myriad products; they need metal in the form of molds and tools; they need metal in many forms for vacuum coating and other applications.

Big Market—One of the largest producers of equipment for the metal and plastics industries exhibiting at the show, Hydraulic Press Mfg. Co., Mount Gilead, O., does about 50 per cent of its business with the latter.

"Our volume on the plastics side runs about $4 to $6 million a year," says R. W. Powell, manager of HPM's plastic machinery division. "And for the first half of this year, the division's sales are ahead of those our company is making to the metalworking industry, probably because of the slackening off of defense contracts."

It's estimated HPM is one of 30 or more equipment producers (of all sizes) supplying the up-and-coming industry. Another exhibitor that numbers presses as only one of its many products sells from 35 to 40 of them yearly for the preforming and molding of plastics. Prices are in the $12,000 to $30,000 bracket.

Dependency — In the words of John C. Moricoli of the C. L. Gougler Machine Co., Kent, O., "the plastics industry can be no better than its machinery."

Gougler, one of the large contract machine shops, sells about $780,000 worth of molds to the plastics industry each year, according to Mr. Moricoli.

"To give you an idea of what this means in terms of metal," he explains, "we recently made a 10½-ton mold for a plastic TV cabinet. It used from 6½ to 7 tons of Crucible CSM-2 tool steel."

Prospects—A surprising portion of the 172 exhibitors at the show represented the metalworking industry in one way or another. Their judgment is backed by these facts: The $1.5-billion plastics industry is booming. Output of synthetic resins, its basic material, was estimated at 3 billion pounds in 1953 — a 30-per-cent increase over the year before. This year the Society of the Plastics Industry expects production to hit 3.15 billion pounds.

General American Transportation Corp.

PLASTIC PARTS
. . . there's metal in the picture

Significantly, the development of new and bigger equipment to fabricate more and larger plastic items is cited by SPI as one of the prime factors in the industry's growth.

Iron, Steel Wages Up in April

Average hourly wages were up and total employment was down in the iron and steel industry in April, compared with March.

American Iron & Steel Institute reports that the average hourly cost of wage earners for April was $2.296, compared to $2.278 in March.

Employment in the industry was estimated at 609,400 for April, against 620,500 in March. Wage earners worked an average of 35.8 hours per week in April.

Gearmakers Look Up

Optimism grows over second-half business as civilian ordering increases

GEAR MANUFACTURERS believe that the wheels of industry will turn faster in the second half than in the first. The result will be a 1954 annual volume equal to that of 1952.

That is the consensus of delegates to the 38th Annual Meeting of the American Gear Manufacturers Association at the Homestead, Hot Springs, Va., June 6-9.

Civilian Pickup—Business in the first four months of this year was 5 to 6 per cent below that for the comparable 1953 period. A pickup, almost entirely in civilian work, is noted now by a majority of the gear manufacturers. Because gears are components, the pickup is attributed as indicating a general industrial improvement in the coming months.

Defense work continues to taper, and gearmakers whose production has been largely for the military are again looking to civilian markets.

AGMA reports volume for the industry increased 23 per cent in April over March. The latest index is 158 (1947-1949 = 100), compared with 128.6 in March and 217.1 in April, 1953.

New Faces—R. B. Holmes, general manager, Link-Belt Co., Philadelphia, is the new president of the AGMA. He succeeds G. H. Sanborn, sales manager in Detroit, Fellows Gear Shaper Co. Marvin R. Anderson, executive vice president, Michigan Tool Co., Detroit, is the new vice president. Fred R. Eberhardt, president of the Eberhardt-Denver Co., Denver, continues as treasurer, and John C. Sears as executive secretary.

Lake Shipbuilders Tackle New Jobs

With orders for ore boats virtually nonexistent, Great Lakes Shipyards turn their hands to nonshipbuilding work to avoid serious slump

FOR GREAT LAKES shipbuilders, it looks as if the proverbial fat years are over and the lean ones about to begin. But in at least some of the lean years a supplementary diet of nonshipbuilding work may stave off really serious trouble.

Many shipyards have always done some nonshipbuilding work; now more are actively seeking it in the face of nonexistent new ship orders.

Bridgework — At least three yards are currently working on components for Merritt, Chapman & Scott Corp.'s foundation for the big suspension bridge at the Straits of Mackinac, Mich. American Ship Building Co., Cleveland, is constructing caissons. Defoe Shipbuilding Co., Bay City, Mich., is fabricating 2000 tons of pipe structures to be used in lowering the caissons. Christy Corp., Sturgeon Bay, Wis., is assembling seven derrick scows; the scows were built on the Mississippi by other firms, the derricks by American Hoist & Derrick Co., St. Paul, Minn.

American Ship Building is also constructing a derrick boat for the Army's Corps of Engineers and does heavy fabricating work. Defoe Shipbuilding manufactures steel storage tanks and does a variety of structural steel fabrication.

Canadian Outlook — Canadian shipyards are feeling the pinch too; practically no new ships are on order there either. But Canadian Shipbuilding & Engineering Ltd.'s Port Arthur (Ont.) Shipbuilding Co. Ltd. yard is kept busy by an industrial division that makes pulp and paper mill machinery and mining equipment. It also operates a large joiner shop that turns out millwork, such as window frames, for buildings.

The machine shops and brass and iron foundry at the company's Collingwood Shipyards Ltd. also have been highly successful at getting nonshipbuilding work.

Slow Upswing—But the bread-and-butter business of the shipyards will probably remain, naturally enough, shipbuilding and repair. Some shipbuilders are talking hopefully about the St. Lawrence Seaway bringing new business, though they admit it will be a while before this upswing is felt.

U. S. Steel

GREAT LAKES SHIPYARDS
. . . plans laid for the lean years

And Canadian ore shipments apparently won't call for new shipping right away either. It takes well over a year to build one of the big ore boats. So if the ship operators were expecting a big increase in business soon now would seem to be the time to order.

Repairs As Usual — But even though construction is down, repair work next winter will be about the same as last year, according to the ship operators. So yards specializing in repair, like Knudson Bros. Shipbuilding & Dry Dock, Superior, Wis., which is completing its largest season, apparently can expect another good year.

Another encouraging note — Adm. Lyndon Spencer, president of the Lake Carriers' Association, says that 40 of 272 ore carriers registered with the association are at least 50 years old and should be replaced during the next ten years.

"Piggy-Back" for Ocean Ships?

The case for "piggy-backing" truck trailers aboard ocean-going freighters has advanced another step.

McLean Trucking Co. has completed its presentation of its appeal for government sanction of a proposed roll-on-roll-off trailership service on the Atlantic seaboard. Interstate Commerce Commission recessed the case until July 7 when some 40 protesting counsels will give opposing arguments.

McLean wants to construct a minimum of four ships, each with capacity to carry 285 loaded truck trailers. Cost of each vessel would be approximately $6 million.

Engineer Trainees Needed

Needed: More engineering and technical trainees.

American industry now needs more metallurgical engineers than will be graduated in the next 5 years, estimates American Society for Metals, even though about 3000 metallurgical engineering students are in school.

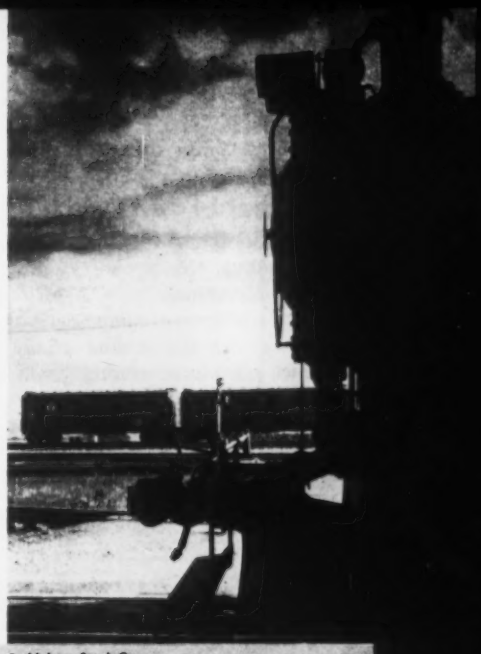
Less than 10 per cent of these students are expected to graduate this year. About 20 per cent of the total probably will never work in metallurgy.

Russia is training about twice as many technical people as the United States, pointed out Dr. Francis M. Dawson, dean of the College of Engineering, State University of Iowa, at a technical forum at the new Fairbanks, Morse & Co. plant in Kansas City, Kans.

Also at the forum, Dr. Richard G. Folsom said that the stockpile of ideas in the United States is very low and that success of future research depends on close co-operation of industrial companies and educational institutions. Dr. Folsom is director of Engineering Research Institute and professor of mechanical engineering, University of Michigan.

Freight Car Builders Hit Bumpy Road

Always a cyclical business, freight car building is presently in a trough. Ahead are better days as car loadings revive and demand for new types of equipment picks up



Bethlehem Steel Co.

FREIGHT CAR building is living up to its reputation for being a tough, rugged business. Though there are signs of an upturn in car building ahead, currently orders for new cars are slow and backlogs are still skidding.

Reason for the present drought in car building is not hard to find. The decline in car loadings has leveled off at a reduced rate but shows little buoyancy. And when loadings are down, the railroads won't buy. That's especially true with the surplus of serviceable cars well up—140,000 in May, 1954, against 40,000 a year ago and 18,000 two years ago.

Mild Surprise—Order backlogs for freight cars dropped to 17,817 cars on May 1 of this year from 29,950 on Jan. 1, 1954, and 80,296 a year before that. Many cars, among the modest number being constructed, are being built by the railroads themselves. Hence it is not surprising that some car building shops have closed down, with others to follow.

Pressed Steel Car Co., which has gone in heavily for diversification in recent years, is disposing of its freight car business by closing down its last freight car plant in Mt. Vernon, Ill. And diversification is spreading among other car builders—thus the significant name change by American Car & Foundry Co. to ACF Industries Inc., though this company is in no sense withdrawing from the car building field.

Wait for the Lift — All is not bleak in the car building outlook, however. There's some promise of a pickup later in the year.

By late summer, car loadings should be definitely on the upgrade, as the grain movement picks up and heads for a likely peak in October. By that time, also, the steel industry and certain other heavy shippers anticipate a livelier movement of their products.

Piggy-Back Progress—For progressive car builders, efforts of the railroads to regain traffic and stature lost to trucks and barges presages brighter building days ahead, too. Railroaders are interested in any type of new equipment which promises to help in their competitive struggles.

Generating the most activity and speculation are piggy-back railroad cars for hauling truck trailers over long distances by rail. Pullman-Standard Car Mfg. Co. is developing an all-purpose flat car, designed for both piggy-back and conventional hauling. ACF has plans for building piggy-backers. Electro-Motive Division, General Motors Corp., has a design for such a car. Electro-Motive is not marketing the equipment, but it is working with interested car builders under a licensing arrangement.

Ready To Try — While piggy-backing is still only in the trial-and-error stage, many railroads have indicated they are ready to try. NYC plans to utilize 250 special cars on a rental basis. The Pennsylvania Railroad closed bids early this month on lots up to 200 for 75-ft depressed-center cars for piggy-backing. The Erie; Delaware, Lackawanna & Western; Missouri-Kansas-Texas; Chicago & Northwestern; Union Pacific; and New York, New Haven & Hartford, all are either inaugurating or expanding piggy-back service. Most will start out competing with, instead of serving, trucking firms.

With such widespread interest, can substantial new car building orders be far behind?

DOMESTIC FREIGHT CAR AWARDS

	1948	1949	1950	1951	1952	1953	1954
January	8,619	1,638	9,380	25,926	5,248	7,406	2,942
February	10,695	332	9,065	13,775	6,026	2,284	2,057
March	13,227	199	6,201	10,511	5,833	3,247	348
April	17,205	30	3,298	6,190	586	2,102	909
May	2,141	589	11,635	3,849	2,527	1,645	....
June	5,368	153	2,095	6,040	2,385	1,453	....
July	10,508	408	30,065	2,401	1,536	1,671	....
August	3,244	185	23,832	1,761	3,300	3,913	....
September	738	123	25,086	8,992	2,999	3,867	....
October	8,330	201	21,304	3,175	1,108	1,705	....
November	4,352	1,145	10,427	6,496	2,878	2,858	....
December	8,348	1,220	3,344	3,359	1,156	2,159	....
Total	92,775	6,223	155,732	92,475	35,582	34,310	....

Source: American Railway Car Institute.

Republic To Buy Chain Firm

Cleveland Chain and its affiliates will become part of Republic Steel by July 15

REPUBLIC Steel Corp. has agreed to buy the property and assets of Cleveland Chain & Mfg. Co. and its affiliated companies.

Final sale of the Round chain companies—a name arising from the Round family, founders of the original business—will be consummated before July 15 after completion of certain legal details.

Some Before, Now More — Charles M. White, Republic president, said the Round organization previously had constituted a substantial consumer of steel. But now they will become substantial consumers of Republic's steel, particularly of alloy grades.

Total employment of the Round affiliated companies to be acquired by Republic is about 1000 persons. Building floor space of the various plants and warehouses is about 450,000 square feet, with the largest of the plants being in Cleveland.

Chain Outlets—Principal customers of the chain companies include the shipping and lumber industries, automobile and truck manufacturers. Products of the Round chain affiliates are sold in all 48 states and in more than 28 foreign countries.

R. L. Round is president of Cleveland Chain & Mfg. Co., and James W. Dickey is executive vice president.

Foreign Process Adopted

Kaiser Engineers obtain sole selling rights in the U. S. for the oxygen steelmaking process

KAISER Engineers Division, Henry J. Kaiser Co., Oakland, Calif., acquired the exclusive rights in the United States for the European oxygen steelmaking process.

As sole U. S. licenser for Brassert Oxygen Technik A. G. of Zurich, Switzerland, Kaiser Engineers joins the world-wide partnership of member firms which have developed this new approach to steelmaking.

A wide range of pig iron analyses can be refined by this process and the quality of the resulting steel is as high and can be as closely controlled as in open-hearth practice. Up to 25 per cent of the charge can be scrap metal.

Compares Well—Estimated production tonnages for each converter are 2½ to 3 times higher per hour than the conventional open-hearth furnace, says George Havas, vice president and general manager of Kaiser Engineers. The operating costs (exclusive of metallics and fixed charges) for each ton of steel produced is at least $3 lower than similar costs for open-hearth steel, he says.

Current estimates place the capital cost of an oxygen converter shop at 50 per cent or less than a comparably sized open-hearth shop, depending on size, location, available facilities and other variable factors.

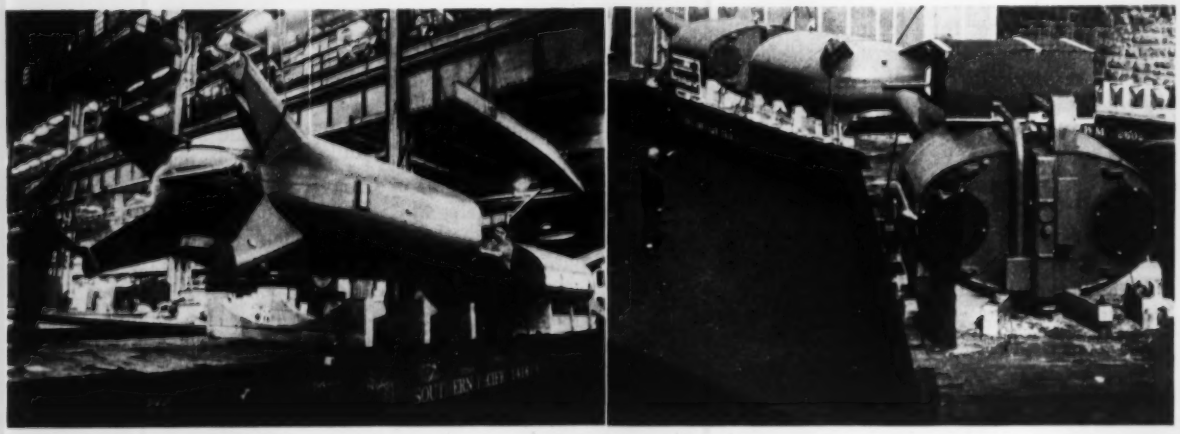
State Gagged in Labor Tilt

A Pennsylvania court finds it cannot act in a union-management dispute

SPOTLIGHTING the need for clearer states' rights in labor-management disputes, a Pennsylvania Common Pleas Court held it could not enjoin a secondary boycott in that state because of the current federal pre-emption doctrine.

The case involved a rigging contractor's company and the AFL plumbers union. The company was being put out of business by a secondary boycott that developed in the course of a jurisdictional dispute between the plumbers union and the riggers union which represents the company's employees.

Overlapping — The Pennsylvania court recognized the justice of the company's complaint but found it could not act since the boycott also violated the Taft-Hartley Act. Should it pass an enforceable decree on the basis of violation of state law, the court concluded, the



Big "Switch" Will Control Power for Atomic Project

Not flying saucer components, but sections of a 25-million-kva circuit breaker are loaded for shipment from Westinghouse Electric Corp.'s East Pittsburgh plant. Breaker is first of 35 to be installed in new 330-kv power system for Atomic Energy Commission project in the Portsmouth, O., area. It is capable of turning on and off all power used by a city the size of Pittsburgh. Each section is 28 ft high, weighs 30 tons and contains 3500 gallons of oil

Cold-weather Clocks

Even at 65 degrees below zero aircraft clocks running on cold-weather lubricant developed by Elgin National Watch Co. work perfectly. Clocks at left in cold chamber are equipped with conventional lube, have stopped

decree would "trespass upon current Congressional philosophy that there should be a national agency capable of forging uniform national labor relations and procedures."

In other court decisions reported by the National Association of Manufacturers, two separate U. S. Circuit Courts of Appeals reversed National Labor Relations Board findings.

Firm Stand—The Court of Appeals for the seventh circuit found that Allis-Chalmers Mfg. Co. had not refused to bargain in a recent hassle with its union. Allis-Chalmers had insisted on ratification of a union contract by a majority vote of all employees (union and nonunion) in a secret ballot and the same kind of a vote before the union could strike over terms of a new contract. NLRB had ruled that the company had refused to bargain.

Another NLRB doctrine — that an employer who re-employs any strikers who engaged in unlawful conduct during a strike thereby condones similar misconduct of all other strikers and must rehire them all—was denied by the Court of Appeals for the third circuit. In this case the court found the employer who rehired only some of such employees was simply exercising his normal right to select his employees.

How Valuable Is Service in Washington?

The government is asking for more top industry brass to serve in Washington on a loan basis. Here's an evaluation of such service by one man who's been through the mill

IS THE TIME spent in Washington as an adviser from industry really worth it to the country, to a man's firm and to the individual involved?

Perrin G. March III, until recently director of Metalworking Equipment Division, Business & Defense Services Administration, Commerce department, answers this way: If the businessman has the right abilities and background, his service is invaluable to both the government and his industry.

Give Till It Hurts — Trouble often starts with the understandable urge to send someone who won't be missed in industry. Mr. March, president of Cincinnati Shaper Co., points out that this won't work for two reasons. First, if he isn't needed at home, he probably doesn't have the stuff to make the right decisions in Washington.

Mr. March says, "The industry representative at Washington is more powerful than any other single man in the industry. He is frequently called on to make spot decisions or recommendations which involve millions of dollars and which may influence a whole segment of business. The wrong answer or statement would often be worse than no answer at all."

Chiefs Wanted—Another reason for sending top brass is that Washington is protocol conscious. Mr. March's observations: If an executive carries a top title, it's taken as evidence of his acceptance within his own firm or industry. He's sought after for advice. If, however, the title of an "indian" is taken to the capital, the man has the prestige block to hurdle before he becomes fully effective.

In addition to a better understanding of industry's point of view, Washington is interested in top flight WOC's because they will form the nucleus of a well-informed government-acquainted organization. They can go into emergency operation on a moment's notice.

Time Savings—Their responsibility would be the handling of material allotments, product contract and equipment diversions. Enlightened experience here can save much critical time in an emergency.

The metalworking executive, on the other hand, gets a good return on his investment. First, he is able to get inside personal experience on how government operates. In days of extensive government contracts and controls, this is an extra trump card that can save time and money.

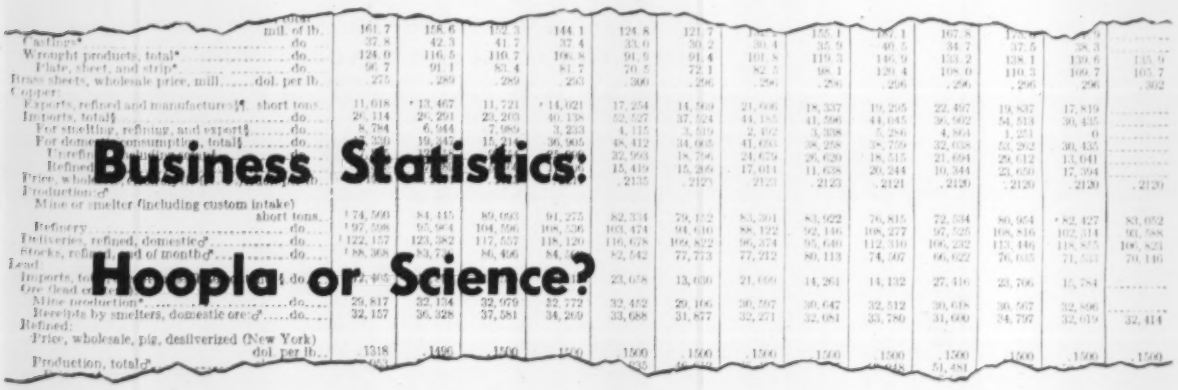
Broadening Experience—Association with other industry representatives in Washington and those who come to Washington greatly broadens personal contacts in one's own and allied fields. It frequently enables the man to bring new ideas to his operation. It also gives a truer picture of how an individual plant and industry fit into the total picture.

The trip to Washington can help at home too. Mr. March feels his trip to the capital helped him get a good idea of how his company operates without him. He thinks it's an excellent chance to size up his personnel situation simply by letting them take all the responsibility and authority.

No Vacation — Above all, Mr. March warns, the Washington job is not part-time. WOC's must expect to spend at least five days a week at that work. If they intend to spend a couple days back in the home office, they won't get either job done well. The government work is intriguing, but it's also demanding.

Government is in the market for qualified WOC's all the time. For instance, in BDSA there are 25 industry divisions, many of which do not yet have badly needed WOC directors. In addition, there are three assistant administrator positions. All of these jobs are filled on a six-month basis. Result: A continuing need for, and shortage of, men who can fill the big pair of shoes worn by industry representatives in Washington.

By E. C. KREUTZBERG *Washington Editor*



Business Statistics: Hoopla or Science?

HOW GOOD are government statistics presently available to industry for business forecasting?

Some present statistics, though by no means all, leave the field open for a lot of guesswork. Even when there are no war or other catastrophic events to upset calculations, use of those statistics makes forecasting at best chancy.

Improvement Indicated—Improving these forecasting and analyzing tools, up to now a sporadic procedure, has been made the responsibility of a new permanent Subcommittee on Economic Statistics of the Joint Congressional Committee on the Economic Report. The parent committee, one of the most scholarly in Congress, bears the duty of analyzing the President's economic reports to Congress and formulating recommendations as to what Congress should do to maintain and stimulate economic progress.

Businessmen can get an appreciation of the wide field the JCCER covers by reading a report it completed in February of this year. That report, identified as House Report No. 1256, may be obtained from the Government Printing Office.

History of Irritation—Ever since the parent committee started to function, it has been disturbed over the need for more comprehensive statistical information. In 1948, it issued a report on "Statistical Gaps." In the same year, it pointed out limitations in the BLS Consumers' Price Index, with the result that that index has since been improved. In 1949, it complained that lack of information prevented a penetrating examination of employment problems.

Only recently, the committee reiterated that complaint by calling attention to the "apparent inconsistencies and inadequacies in the separate but related data on labor force, employment, and unemployment" which "throw doubt upon the accuracy of appraisals of the current economic situation."

Long-Range Job . . .

So the new subcommittee will explore the feasibility of developing better tools for making economic measurements. It's composed of Rep. Henry O. Talle (Rep., Iowa) as chairman, Sen. Frank Carlson (Rep., Kansas) and Rep. Richard Bolling (Dem., Mo.). First step, says Chairman Talle, is study of the relationship of presently existing statistics to statistical requirements. That will be done in conference with Dr. Arthur F. Burns, chairman of the President's Council of Economic Advisers, and representatives of the Bureau of the Budget.

From these conferences will come recommendations which the Talle subcommittee will submit to a panel (or panels) appointed from business, financial and economic institutions. This panel (or panels), says Mr. Talle, will be asked to "advise the subcommittee on the selection of particular areas for intensive investigation, as well as the objectives of an integrated system of federal economic statistics and the standards or tests that should be applied by the subcommittee in evaluating present programs. All this is a preliminary to the subcommittee's recommendations for further improvement."

There is to be no haste on the part of the subcommittee in view of the complex character of this chore. "It is not planned to take up more than one or two areas at a time," says Chairman Talle. In fact, the job may never be completed, as progress in the field of statistics is always subject to complication by unexpected economic turns.

Data Not Formulas . . .

As a side issue, the subcommittee has been asked to keep tabs on the JCCER's publication, *Economic Indicators*, with a view to improving it. This monthly carries 32 statistical studies which are regarded as the most useful—two on total output of the country, four on prices, five on employment and wages, nine on production and business activity, six on purchasing power and six on credit, money and federal finance. This periodical is used by large numbers of businessmen for ready-reference purposes, but neither it nor the committee has ever attempted to promulgate a formula as to what statistics to use in co-ordination for detecting and measuring business trends. The committee feels that as better statistics become available, their use in combination may result in techniques for assuring more accurate readings.

What results in this direction depends in large measure on the findings of the new Subcommittee on Economic Statistics.

Automatically!

Demands by the automotive and steel fabricating industries have promoted the design of larger and faster presses. Satisfying the maximum capacities of these presses presents a problem in "Automatic" feeding. After all, there is no sense in designing more speed and capacity into a press unless it can be used to advantage.

Press builders and users both turned to "McKay," long a leading designer of "Automated" machinery, for a solution to their feeding problems.

McKay engineers came up with the answer with an "Automatic Press Feed Line" which includes: coil preparation, also cleaning, processing, leveling and feeding the strip in perfect condition at hitherto unheard of production speeds. THAT'S WHY **TODAY** THE TREND IS TOWARD **McKAY.**

• • •

Other "Automated Equipment" built by McKay includes Strip Cut-up Lines, Bar and Tube Draw Bench Lines — Cold Roll Forming and Cut to Length Lines, Electric Weld Tube Mill Lines — Tube Cut-up Lines.

Consult with McKay engineers when you have a special "Automation" problem.

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Measuring Export Trade

Venezuelan case history shows amount of U. S. dependence on exports to that country

HOW IMPORTANT to the U. S. is export trade to Venezuela?

A study by the World Trade Foundation, government statistics and a survey made for the Venezuelan Chamber of Commerce of the U. S. supply interesting measuring sticks:

Men—About 160,000 jobs in the U. S. are dependent on U. S. sales to Venezuela.

Money—Venezuela spends about $860 million in the U. S. every year. Roughly $500 million for merchandise purchases.

Factories — Approximately 700 companies in 450 communities in 43 states depend to some extent on U. S. sales to that country, based on coverage of only one-third of the total trade during the test period.

Products—Of the $500 million in merchandise exports each year, major commodities include machinery and vehicles, metals and metal manufactures, foodstuffs, textiles, chemicals, and wood and wood products.

Sounds Good, But—The World Trade Foundation, which promulgated the above information, is a newly formed organization dedicated to showing the average U. S. citizen his stake in world trade. "That doesn't mean the foundation stands for free trade," says William J. Barnhard, WTF director. "Theoretically, free trade sounds good but leaves questions unanswered. Practically, free trade is now an economic and political impossibility."

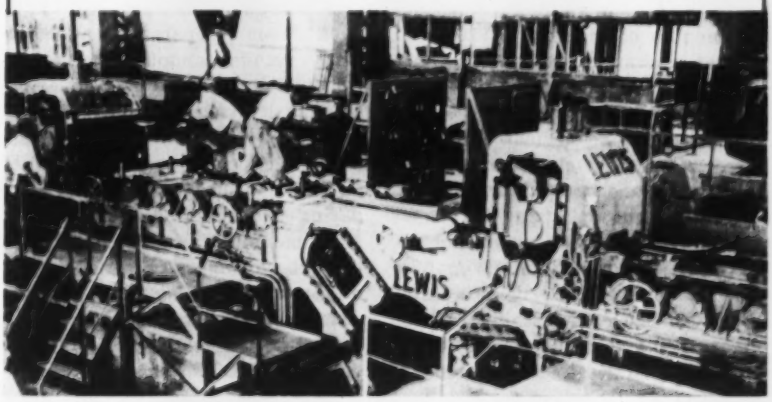
Aside from the question of free trade, Mr. Barnhard believes the measurements above show Venezuelan trade has great value to American manufacturers and is worth the effort to keep and to build up further.

Japan Returns To Near-Record Steel Output

JAPAN has made a strong postwar comeback in steelmaking, particularly within the past five years. Much of the credit for the revival of Nipponese steelmaking must go to American equipment and engineers for providing the latest plant and equipment with which to work.

An important part of the rehabilitation of the Japanese steel industry is a 28-in. continuous hot strip mill designed and partially built in the U. S. by Lewis Machinery Division, Blaw-Knox Co., for Nichia Steel Co. at Kure, Japan. As presently constituted, with a single heating furnace, the mill has an approximate output of 38.5 net tons per hour. Shown below is the downcoiler of the mill, officially opened June 17, 1953.

Steel output in Japan rose from 3.9 million tons in 1940 to a peak of 9.7 million tons in 1943. Thereafter it dipped to a low of 608,000 tons in 1946. Last year output hit 8.4 million tons, and it's expected production will approach the 1943 peak tonnage again by the end of 1954.



Reynolds Goes to Philippines

Reynolds Metals Co. will build a new aluminum foil and sheet plant in the Philippine Islands to be operated by a Philippine company known as Reynolds Philippines Corp. The parent American company will own 51 per cent of the stock and will supply a core of American management men to train Philippine personnel in operation of the plant.

Cost of the 65,000-sq-ft plant will be about $3 million. It will employ about 150 workers, a majority of which will be Filipinos. All of the island's needs—plain and corrugated sheet for buildings; circles and blanks; foil for cigarets, labels and packaging are expected to be supplied by the new plant.

New FOA Grant for Spain

Foreign Operations Administration has granted a new allotment of $45.7 million to Spain for defense-support buying. That raises the total ante to Spain under the FOA program begun last fall to $85 million.

Jessop Steel Co.

Supervisors' suggestions for contract changes are important when you . . .

Prepare for Contract Negotiations

AN INDIANA manufacturer spent six months considering a $100,000 capital equipment expenditure but only six days preparing for labor contract negotiations which eventually led to a settlement that cost an equal amount per year.

Today's labor negotiations take careful advance planning by management. The union negotiator is frequently more than a match for his management counterpart. Why? Because bargaining is the union negotiator's full-time job; bargaining for the management man—particularly in the smaller plant—is often a once-a-year, extra-curricular activity.

A Pattern—But—True, what's happening in "Big Steel" negotiations currently under way will set the pattern for your coming contract sessions. But it's only a pattern. You should be prepared to negotiate as an individual company a contract tailored to fit your specific situation.

First step: Know exactly how your wages and benefits compare with other plants in your industry and with plants in your area. This is a basic preparation and too many details cannot be gathered. One pitfall to avoid is comparing rates in job classification: If company A pays $1.90 for a machinist, before comparing your machinist's $2 rate be sure that you're comparing the same jobs. Company A's machinist might actually be the job you classify as lathe operator at $1.90.

Where To Go—Getting these facts is relatively simple. Go to your national association for your industry's wage and contract comparisons. Area information can be gained from local manufacturers' organizations and from individual companies. Most companies no longer stick to the old philosophy of secrecy—they've seen how it opens the way for unions to play one company against another in negotiations.

Contract negotiations are a two-way street. Management, as well as the union, may see desirable clause changes which would improve the contract. One of the best places to start is with your supervisors—they're the ones who live with the contract clauses day by day. Ask them what suggestions they have for improvements or corrections in the contract. Check over the past year's grievances to see if contract changes will improve or correct those specific cases.

Economics—Most important in any preparation is to determine how much of a wage and contract package you can afford. Regardless of what the national pattern is, your own situation will determine what you can or cannot do at the bargaining table. Economic climate this year suggests less pressure for wage increases and more emphasis on demands affecting job security. Those, too, cost money, and you will have to bargain tightly, always keeping in mind your competitive status. Management must insist on improved guarantees of quality, productivity and operating economies in return for concessions this year.

Who'll do your bargaining at the negotiation table is also important. Select men who are respected by the union and who are familiar with the contract and company-union relations. Size of your team will vary; however, three or four men are considered good. Finally, select one man to act as spokesman for the team and be sure each member is thoroughly acquainted with company policy regarding the negotiation. Most officials agree that the company president should not be a member of the team. This is primarily a bargaining tactic so that the negotiators do not have the final authority and cannot be placed in the situation "you must answer yes or no immediately" to some demand upon which strike action may depend.

The Contest — Negotiation implies the element of give and take. It's at the bargaining table where preparation plus strategy pay off. J. George Piccoli, director of in-

dustrial relations for Associated Industries of Cleveland, offers these suggestions: Conduct your sessions in plain simple terms, but don't try to "talk down" to union representatives. Be realistic; this is a transaction in which you're buying a service. Be careful of using the automatic "no"—there are many ways of giving a negative response which will leave an opening for changing your mind; your "no" should be emphatic and mean just that.

Mr. Piccoli, who negotiated 128 contracts last year for AIC members, says charts are also valuable to mangement at the bargaining table. For example, a cost-of-living comparison to wage increases since 1940 will generally be favorable to the company.

Take a Close Look—It's general practice for a union to submit its list of demands in advance of actual talks. Management should go over each item carefully and try to determine which items the union will press for as "musts" and which are meant to be "trade" items. It's good management policy, too, to have its desired contract changes so categorized.

Remember this: The union negotiator is representing his members and his position depends upon how good a job they feel he is doing. If he asks for a 10-cent wage hike and you grant it the first day, the members are going to feel that he could have gotten them more. They'll think much more of him if he asks for 15 cents and gets only 7 cents after three weeks of negotiating.

Be Realistic—For that reason, don't be ridiculous when you answer the union demands. For example, if they seek a 25-cent wage hike and 40 contract changes, you should not counter with a 25-cent-cut proposal with 41 contract changes. If you know you can afford at most a 10-cent total package, offer 3 cents and begin the talks.

Another bit of advice from Mr. Piccoli: If it begins to look as if no agreement can be reached within your 10 cents and a possible government arbitration case could result, don't offer your entire 10 cents. Stop at 7 or 8 cents so the conciliator will have something to work with.

Guides—W. A. Kissock, vice president and manager of industrial relations for Hotpoint Co., lists four fundamentals which must always be considered in making your bargaining table decisions, particularly with regard to fringe benefits:

1. Principle—management's objective should be to do what it should for its employees and to insure that they do what they should in fair return.

2. Cost—management should consider both the near-term and long-term costs involved in wage and benefit concessions.

3. Precedent—management should consider all the implications upon industry and the community of establishing a new trend or practice in its contract.

4. Application and administration of a fringe benefit—management should look not only upon the direct cost of the benefit, but upon the total impact on job structure and productive efficiency. For example, if a company's vacation policy now gives the firm a 50-week production year, a longer vacation might shorten the production year to 48 weeks. This could possibly weaken the firm's competitive position.

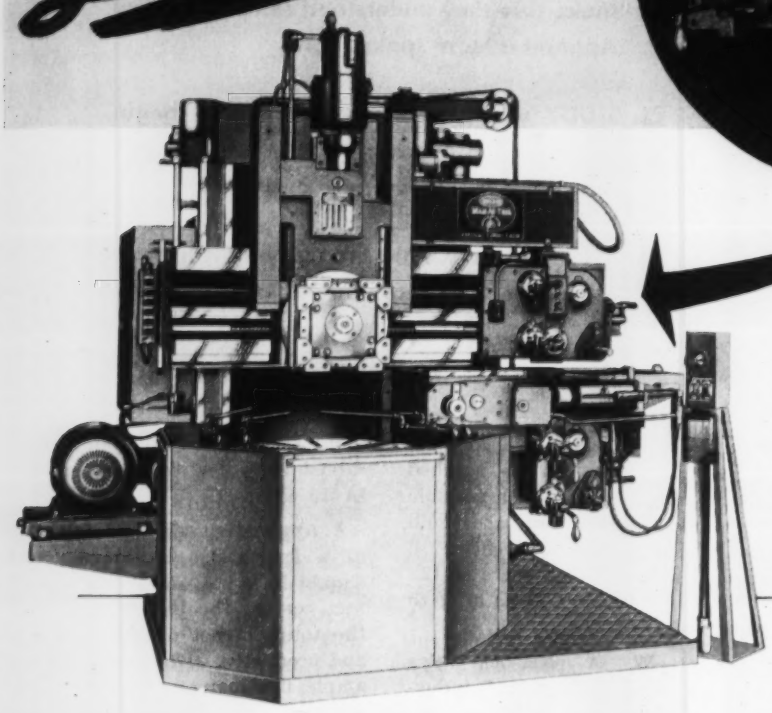
The Strike—In any negotiation, a strike is always a possibility. AIC's Mr. Piccoli has this to say about the threat: "If the strike is threatened, go home at night and look into the mirror and ask yourself, 'Am I prepared to take a four to six-week strike to win?' Go to bed, and the following morning repeat the same procedure—then make your decision."

You're Ready To Negotiate If You . . .

- ☑ **KNOW to the letter comparable wage scales and benefits of your industry and of your area's industry.**
- ☑ **PREPARE in advance your own list of desired contract changes, bearing in mind which are "must" and which are "trade" items.**
- ☑ **SELECT with care your negotiating team. Make sure they understand company policy. Appoint a team spokesman.**
- ☑ **STUDY union demands before talks begin, if possible. Determine which are "musts", which are for compromise purposes.**
- ☑ **KNOW exactly what the top limit is in wages and benefits that you can afford to give.**

CONCEALED VALUES THAT PAY $ $ $

Dividends



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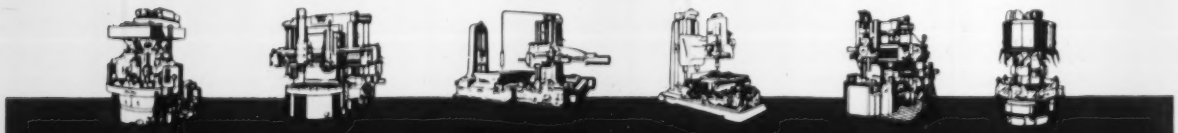

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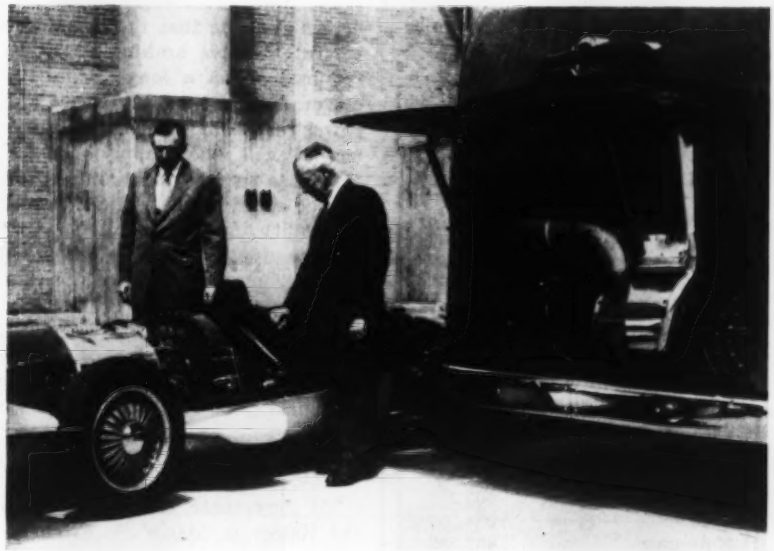

General Motors Rides a Bus To Test the Turbine's Performance

DETROIT

DOWN in Atlantic City at the SAE annual summer meeting last week, General Motors Corp. mixed turbines with the bourbons.

The resulting cocktail being mighty heady stuff, most engineers swallowed slowly, agreed more on the outlook for the bourbon than the turbine. The one thing sure: GM's turbine research is aimed at more than newspaper-space ships.

Design Lab—Implemented was the original GM statement that the Firebird is a laboratory on wheels in the high-performance vehicle category. The four major design parameters to be satisfied in the car were: A shape or style that would symbolize the new power plant, minimum frontal area and exceptional aerodynamic cleanness, stability at all possible speeds and good weight distribution with generally equal front and rear wheel reactions.

But the thing many people had not realized was that the Firebird was actually the second turbine-powered GM vehicle to be planned. When the project in turbine research was initiated some years ago, it was decided to make the first turbine of a size for commercial vehicle application. For convenience in testing, it was decided to install the turbine in a production General Motors transit bus.

Why a Bus?—Among the factors influencing the decision were the possibility of installation in the existing engine compartment with ample space for special instrumentation; the vehicle could be ballasted to represent a wide variety of service conditions with little difficulty; the seating capacity could be used to advantage to demonstrate the new type of power plant; and finally, plenty of space was available to accommodate special test equipment and observers. The appearance of the unit differs from the diesel-powered unit only in the provision of an exhaust duct discharging through the rear roof crown panel.

All special test instrumentation indicators are installed in a console extending across the rear of the coach, including a multipoint temperature indicator, vibration meter, speed indicators and counters, fuel and lube system pressure gages and precision multipoint diaphragm pressure gages for high and low ranges. The instrumentation is nearly as complete as a standard test cell installation and supplies data not usually obtained from an operating vehicle.

Double Play—Before either the Firebird or the Turbo-Cruiser (bus) installations were made, considerable dynamometer testing of both models was accomplished. As both units have the same rotating parts, work on either model was largely applicable to both. Site of this research is the turbine test building at the GM Technical Center.

The first gas turbine was fired up in one of its seven test cells on Aug. 18, 1953. Large enough to handle turbines from small automotive jobs up through present day jet aircraft engines, the building is 240 feet long, 80 feet wide and 21 feet high. In some respects it looks much like a small industrial plant except for the seven large exhaust stacks and silencers along the east wall. Outside the building is a small pump house working from six fuel tanks to minimize the fire hazard to the test building.

User of Air—Extremely high air handling capacity is required in the building both to supply the gulping turbines and to keep explosive mixtures from building up in the test cells. Air for each cell is drawn into the building through a loft as wide as the cell itself, passing through a fibreglass silencing unit and a measuring tank into the gas turbine under test.

At the other end of the cell, exhaust gases which may reach temperatures over 1000 degrees F. pass through a water spray cooler, make a right-angle turn into a vertical silencer and emerge from the stack outside the build-

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ing. With the usual prevailing westerly winds in Michigan, the gases thus do not pollute the air being taken into the cell on the other side of the building. Stainless steel wool surrounded by resonant chambers does the silencing job.

Problem Pending—Among other highlights of the facility is its flexibility for testing many types of turbines and the amount of instrumentation involved in the tests. Data are being collected on just about every conceivable aspect of turbine construction, operation and design. Materials are coming in for a big share of the development work, with higher internal temperatures one of the major problems requiring economical solution.

The GM turbine program is striking in its fundamental approach and adds mute testimony to the belief of the firm in the future of the turbine. It is interesting, too, to note that although the turbine was granted patents before the reciprocating engine, only now is technology beginning to approach the turbine as a more nearly universal power plant.

Trying the Turbo-Cruiser

An opportunity came along recently to ride in the GM Turbo-Cruiser, and because of the somewhat unusual nature of the vehicle, perhaps you'll be interested in what goes on.

As mentioned above, the only visible sign of a turbine is the exhaust stack pointing upward through the rear crown panel to direct the somewhat hot exhaust gases and carbon-monoxide free fumes away from curious newsmen. Starting the engine is disappointingly conventional, with a normal-looking electric starter turning the turbine up to about 3000 rpm and the starting spark plug touching off the mixture much like lighting an acetylene torch with a striker.

The engine makes an interesting collection of noises. One is the steady roar of the combustion a la blow torch. Another is the intake air, which at present is unfiltered and is in the annoying 2000-to-7000 frequency range giving a distinct impression to a man with a guilty conscience that a cop is perpetually on his tail. Exhaust noise is in the 150 frequency area and gives a rather nice power sound of the Hollywood muffler type.

Transmission provides two speeds forward and a reverse, with the driver free of clutch worries. Idling at 10,000 rpm or so, the driver mashes the accelerator flat in initial takeoff and the engine is metered fuel as fast as it will take it to bring the unit up to the red line at 26,000 rpm. In a second or so the turbine is blowing up its full storm and the bus trembles mightily in a forward direction. In three or four seconds you're at five mph and things begin to take hold. Although the initial takeoff is like blowing an airhose through a Dynaflow without any oil, the bus actually hits you in the back and marches up to 60 in about 42 seconds, highly respectable for this type of drag machine, it is said.

While the bus is accelerating the temperatures at the exhaust, the combustor and several other points are swinging upward. The exhaust moves from about 750 at idle to perhaps 1250 at full load.

After a few acceleration runs and subsequent deceleration for the end of the track, the smell of brake lining became evident. The driver explains that in normal use where extensive braking might be required as on a long grade, the driver merely needs to throw the power turbine into reverse, and the engine will then apply braking thrust as required to maintain the proper speed of the vehicle, a neat possibility indeed. Definitely needed are dynamic brakes of some kind for more conventional situations, however.

Riding in the Turbo-Cruiser was a real experience, though you may start wondering if there's an airport near your stop.

Kaiser-Darrin Paradox

To perpetuate an obvious pun, the Kaiser is "darin'." From its styling patterned after a woman's curves to its grill patterned after a woman's lips, the car is unusual. People who ask what kind of car you're driving when it's an MG ask you what planet you're from when it's the Kaiser-Darrin.

Definitely in the realm of dubious blessings are the sliding doors. Once shut they are shut well, but getting them to line up properly supported by the track at the bottom is quite a chore. Even with the door open, getting into and out of the car is no mean job, and with the roof up the chances are good you'll land curbside on your hands and knees. Also against the car are ultra-European lack of weather protection with top and side curtains in place, a sloppy shift gate and the hardest top to erect we have ever experienced. Waiting for the storm to blow over would be easier.

On the good side of the ledger is excellent performance, Jaguarish cornering, well-spaced gear ratios, the most comfortable seats you'll find in any car and a ride that strangely can only be described as baby-buggy bouncish. The combination of soft ride and fine cornering is one of the most striking we have experienced.

The Kaiser-Darrin is an outstanding combination of delicate design and brutal performance even though the lady has a hat pin.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,231	782,491
May	621,154†	685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,821

Week Ended	1954	1953
May 8	154,640	179,621
May 15	153,796	177,805
May 22	157,993	162,447
May 29	148,774	125,868
June 5	120,606	134,879
June 12	138,000	166,832

Source: Ward's Automotive Reports.
*Estimated by STEEL.
†Preliminary.

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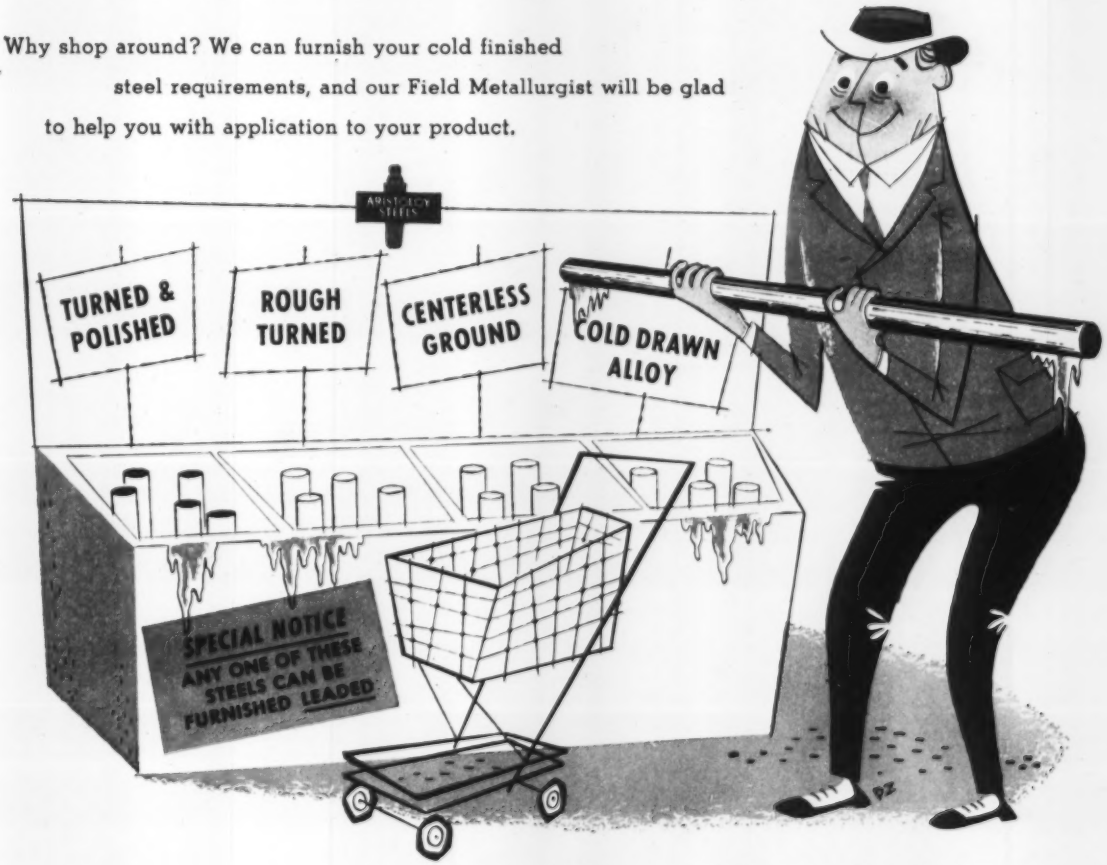

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Carbon-Mo.	Sicromo 2½	Sicromo 5MS	16-13-3
DM-2	2½% Cr.-1% Mo.	Sicromo 7	25-20*
Silmo	Sicromo 3	Sicromo 9M	25-12*
DM	4-6% Cr.-Mo.	18-8 Stainless	35-15**
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	16-25-6**

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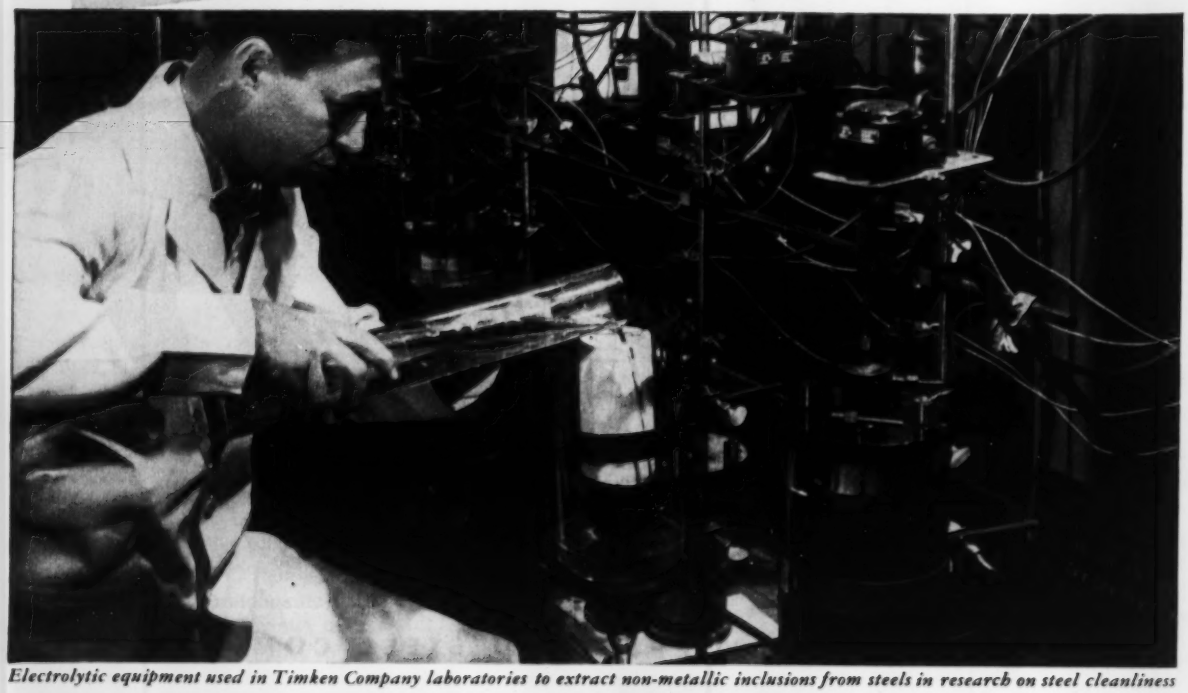
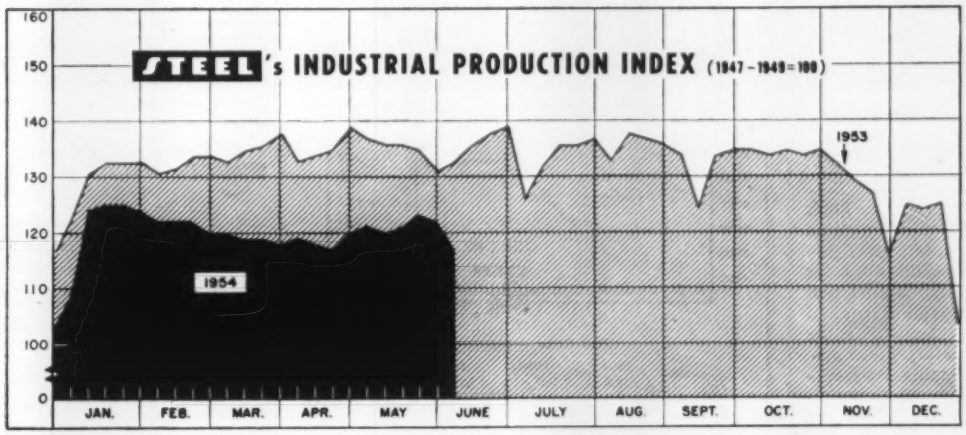
Let the Timken Company's RSQ—Research, Supply, Quality—solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Electrolytic equipment used in Timken Company laboratories to extract non-metallic inclusions from steels in research on steel cleanliness

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



LATEST WEEK*	117
PREVIOUS WEEK	122
MONTH AGO	119
YEAR AGO	133

* Week ended June 5.

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

Production Index Takes Memorial Day Holiday

WHEN THE NATION takes a holiday, business practically stands still, and STEEL's industrial production index shows the effects of such a standstill for the week ending June 5. After registering an adjusted 122 (1947-1949=100) for the previous week, the trend line took a dive to a preliminary 117, the lowest point since early January.

Oddly enough, however, all of the decline was accounted for by the auto industry, which saw a complete shutdown on Monday, May 31, followed by inactivity among several of the auto plants during the rest of the week. *Ward's Automotive Reports* tallied total U. S. auto and truck production for the week at 111,588 units, a drop of 21 per cent from the previous week's total. That was the lowest point of the year for the industry.

Apron-string Relationship — Most of the downward fluctuations in STEEL's index over the past three or four months has been caused by this dynamic segment of industry. The other three components of the index have either been steady-as-you-go or had a tendency to show an upward swing. But let a holiday week or a slowdown for "inventory adjustment and rearrangement" show up in the auto industry and the trend line has slipped off a point or two. It is likely to continue that way for the rest of the year, too.

Steel operations show new signs of responding to the increase in orders which are becoming more frequent. After settling back a little to 70.2 per cent of capacity for the week beginning May 31, American Iron & Steel Institute predicted a rate of 73 per cent for the week ended yesterday. That would mean 1,740,000 net tons of steel for ingots and castings, the highest output since the week of Feb. 22. This continues an uptrend which began about the mid-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,690	1,698	2,246
Electric Power Distributed (million kwhr)	8,250[1]	8,433	8,096
Bitum. Coal Output (daily av.—1000 tons)	1,196	1,192	1,473
Petroleum Production (daily av.—1000 bbl)	6,420[1]	6,431	6,409
Construction Volume (ENR—millions)	$204.4	$288.5	$291.3
Automobile, Truck Output (Ward's—units)	120,606	148,656	134,879
TRADE			
Freight Car Loadings (unit—1000 cars)	680[1]	689	775
Business Failures (Dun & Bradstreet, no.)	225[1]	206	169
Currency in Circulation (millions)[3]	$29,934	$29,697	$29,980
Dept. Store Sales (changes from year ago)[3]	+8%	−5%	0%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,342	$17,794	$16,915
Federal Gross Debt (billions)	$273.5	$273.2	$266.7
Bond Volume, NYSE (millions)	$12.6	$17.6	$19.8
Stocks Sales, NYSE (thousands of shares)	7,321	10,728	6,535
Loans and Investments (billions)[4]	$80.5	$80.5	$75.9
U. S. Gov't Obligations Held (billions)[4]	$33.1	$33.0	$28.8
PRICES			
STEEL's Finished Steel Price Index[5]	189.75	189.75	182.82
STEEL's Nonferrous Metal Price Index[6]	214.5	213.2	224.0
All Commodities[7]	110.8	111.0	109.8
Commodities Other Than Farm & Foods[7]	114.3	114.3	113.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

For stress, wear or vibration a

GRIPCO LOCK NUT

will hold tighter, wear longer, cost less!

The Gripco Lock Nut, with its simple, one-piece design, has given industry a tighter, more positive holding action for quicker fastener application at less initial cost. It provides frictional resistance to vibration and loosening torque — is faster to use — permits repeated removal and reapplication—simplifies production—lowers manufacturing and maintenance costs — has improved the durability of hundreds of products—and has insured greater customer satisfaction. If stress, wear or vibration is your problem, specify Gripco Lock Nuts for greater holding power. Impervious to oil or water. Write for samples and full details.

GRIPCO PRODUCTS INCLUDE:
Gripco Lock Nuts, New Gripco "Clinch" Nuts, Gripco Hi-Nuts, Gripco Pilot-Projection and Countersunk Weld Nuts with or without Gripco locking feature.

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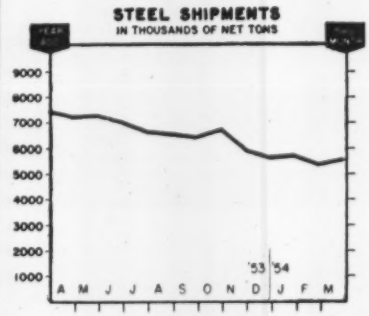
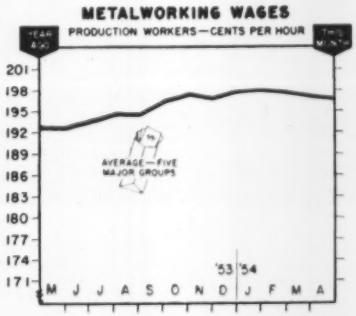
THE BUSINESS TREND



Net Tons

	1954	1953	1952
Jan.	5,727,600	7,067,636	6,589,193
Feb.	5,364,978	6,533,227	6,358,293
Mar.	5,583,690	7,436,919	6,890,391
Apr.		7,162,460	5,922,173
May		7,209,398	5,947,450
June		6,950,059	1,250,243
July		6,582,513	1,413,672
Aug.		6,498,605	6,312,118
Sept.		6,400,757	6,542,147
Oct.		6,726,850	7,155,611
Nov.		5,903,980	6,647,725
Dec.		5,684,920	7,105,382

American Iron & Steel Institute.



(cents per hour)
Production Workers—Five Major Groups

	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
1953					
May	202	183	195	174	205
June	205	184	195	175	207
July	209	185	195	176	207
Aug.	208	185	196	177	206
Sept.	212	186	198	178	207
Oct.	208	187	199	177	209
Nov.	208	187	199	179	210
Dec.	208	188	200	180	211
1954					
Jan.	208	189	200	180	212
Feb.	206	189	200	180	212
Mar.	206	188	200	180	211
Apr.	205	188	200	181	209

U. S. Bureau of Labor Statistics.

Charts Copyright 1954 STEEL.

dle of April. The industry is still shooting for steady production at around the 75-per-cent mark.

Still Strong — Electric energy distributed by the light and power industry continues to maintain its margin over year-ago figures with output of 8.4 billion kilowatt-hours for the week ended May 29. That's a 6-per-cent bulge over the corresponding week in 1953, says Edison Electric Institute. Also continuing a show of strength is freight car loadings for revenue. For the week ended May 29, the total was 689,292 cars, 1.1 per cent above the previous week.

Over-all Employment Up . . .

Employment situation continues to look better over-all, but factory workers are still having a pretty rough time of it. Commerce and Labor departments report that unemployment on May 8 dropped 160,000 from the previous month's 3,305,000, while employment rose 521,000 to 61,119,000. Nonfarm workers decreased by 124,000 over the month, but the government report says there is evidence of a slowdown in the unemployment rate in the durable goods industries.

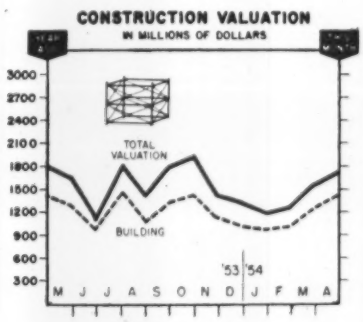
New claims for unemployment compensation, as measured by a 12-state preliminary survey, are at the low mark for the year. For the week ended May 29, they declined to 187,971 for the states involved. That was the third consecutive week of downtrend.

False Impression . . .

Department store sales for the week ended May 29 took what may be an artificial jump of 8 per cent over the similar week last year, according to the Board of Governors of the Federal Reserve System. The 1953 week included Memorial Day; the 1954 week did not. On the other hand, preliminary reports from New York and Philadelphia indicate that sales for the Memorial Day week of June 5 were 14 and 19 per cent under year-ago figures. The comparison week of 1953 in this case did not include Memorial Day. Nevertheless, sales from Jan. 1 through May 29 were behind the same period of last year by only 3 per cent.

Renewed Attention at Capitol . . .

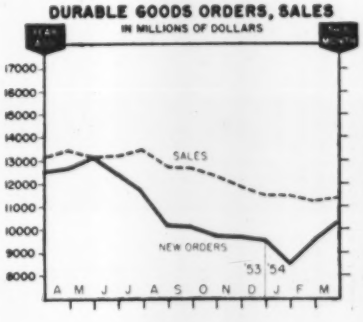
Speaking of businessmen, their attention is focused on the Washington scene more than usual as



(37 States)—In Millions of Dollars

	Total		Building	
	1954	1953	1954	1953
Jan.	1,151.9	1,075.9	935.6	876.0
Feb.	1,221.3	1,021.3	977.5	792.9
Mar.	1,527.5	1,374.5	1,199.8	1,054.4
Apr.	1,691.9	1,741.5	1,401.6	1,354.2
May	.....	1,606.1	.....	1,219.8
June	.....	1,115.5	.....	922.3
July	.....	1,793.3	.....	1,417.8
Aug.	.....	1,414.4	.....	1,053.4
Sept.	.....	1,741.7	.....	1,290.7
Oct.	.....	1,892.4	.....	1,392.7
Nov.	.....	1,394.1	.....	1,096.0
Dec.	.....	1,279.8	.....	973.8
Total	.....	17,423.5	.....	13,455.0

F. W. Dodge Corp.



In Millions of Dollars*

	New Orders		Sales	
	1954	1953	1954	1953
Jan.	8,475	12,454	11,580	12,508
Feb.	9,629	12,416	11,278	12,666
Mar.	10,342	12,520	11,410	13,116
Apr.	.....	12,702	.....	13,398
May	.....	13,101	.....	13,148
June	.....	12,392	.....	13,166
July	.....	11,600	.....	13,410
Aug.	.....	10,139	.....	12,730
Sept.	.....	10,110	.....	12,698
Oct.	.....	9,677	.....	12,376
Nov.	.....	9,631	.....	11,867
Dec.	.....	9,567	.....	11,576

*Seasonally adjusted. U. S. Bureau of Business Economics.

Congress gets ready to adjourn. Focal points: Taxes and housing. In the omnibus tax revision bill, the fate of double taxation of dividends is of prime importance. Original target date for reporting out of committee was June 18. It probably won't make it on time. In the President's public housing proposals, a battle is shaping up over the authority to construct 35,000 public housing units for each of the next four years. The House by-passed it; Senate stuck it in the bill. The outcome could go a long way to determine what construction activity will be in those years. For the present, that industry is still doing all right for itself. For the week ended June 3, *Engineering News-Record* reports new construction awards fell below the same week of last year for the first time in five weeks. Even at that, $204.4-million total was good for a four-day week.

Bellwether . . .

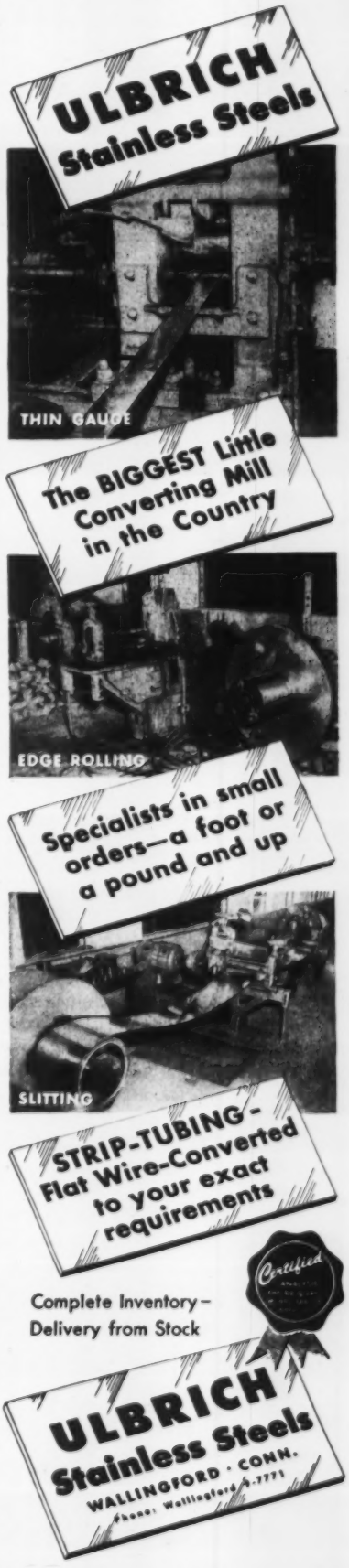
Sign of things to come may be the report of the American Supply & Machinery Manufacturers' Association Inc. that the new order index of industrial supplies and machinery shows a gain for the third consecutive month. The reading of 141.5 (July, 1948 = 100) for March was a one-point gain over February. Because the index lags actual production by several months, the rise probably can be translated into an early reversal of the industrial downtrend.

Another Price Cut . . .

Reflecting the weak position of major appliances in the retail market, Whirlpool Corp. has cut the price of its lowest-priced 1954 automatic washer by about $42. The new price will be in effect through July 31, when the company hopes inventories of competitive washers of 1953 vintage will be sold.

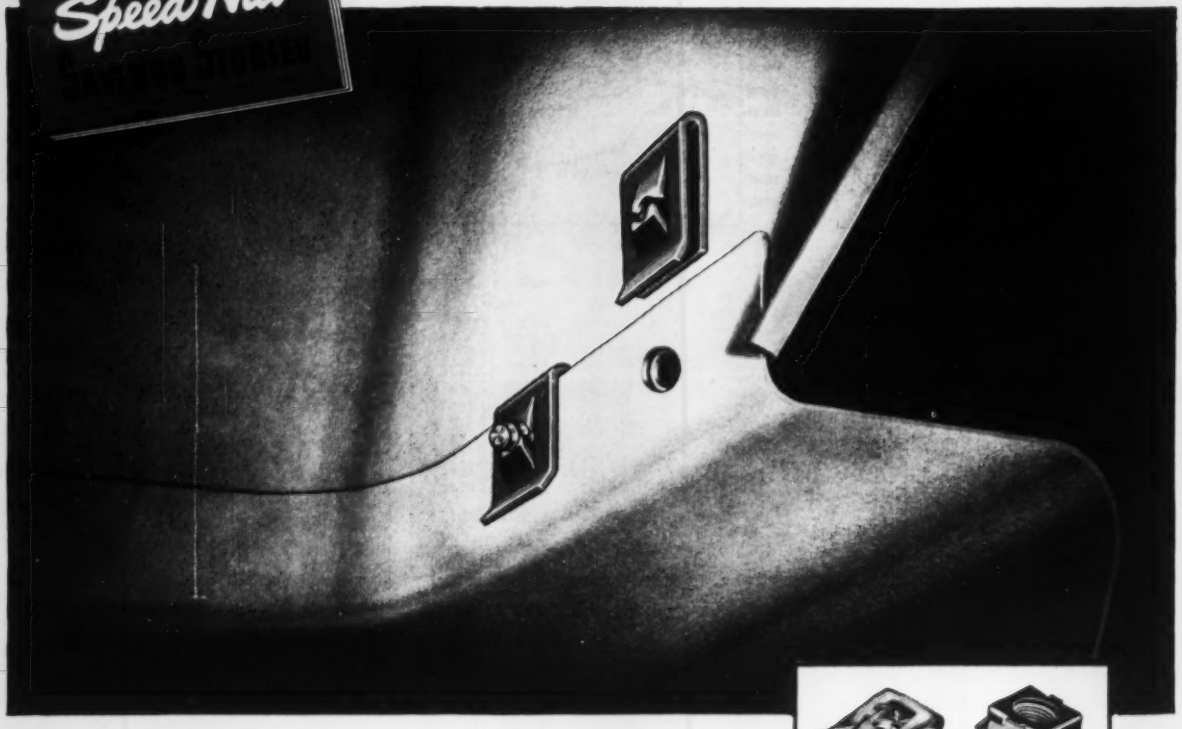
Trends Fore and Aft . . .

St. Louis Packard dealers are experimenting with freight absorption for automobiles, whereby they will sell the cars as if they were bought in Detroit from the factory. If it works, other cities may try it. . .Estimated net income of 130 Class I railroads in April after interest and rentals amounted to $39 million compared with $77 million in April, 1954.



Speed Nut SAVINGS STORIES

FASTEST THING IN FASTENINGS®

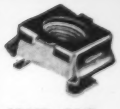


SPEED NUTS® give helping hand on "Yard Hand" assembly problems

The new Hiller Yard Hand is an excellent example of how an assembled product benefits from a Tinnerman Fastening Analysis Survey. This miniature garden tractor, capable of rugged service, is a product of the Hiller Engineering Corporation, Redwood City, California.

Standard "U" Type SPEED NUTS were recommended for assembling the hood to the yoke. SPEED GRIP Nut Retainers were specified for securing the yoke brace to main frame and for fastening saw table to hood. Both types of fasteners snap easily and quickly into place by hand, are self-retaining in screw- or bolt-receiving position, and are ideal for blind locations. Result: heavy duty, vibration-resistant attachments at a significant savings in assembly costs and materials handling! Let Tinnerman lend a helping hand on your fastening problems; ask your Tinnerman representative soon for complete details on the Fastening Analysis Service.

"U" TYPE SPEED NUT



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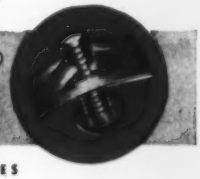
TINNERMAN Speed Nuts®



MORE THAN 8000 SHAPES AND SIZES

BENNETT ARCHAMBAULT
. . . Stewart-Warner president

Bennett Archambault was elected president and a director of **Stewart-Warner Corp.**, Chicago. He succeeds **James S. Knowlson** who continues as chairman of the board. Mr. Knowlson assumed the presidency in 1939 and has been chairman since 1934. Mr. Archambault has been vice president and general manager of M. W. Kellogg Co.

Edgar W. Engle, manager of product and process development engineering, **Carboloy Department**, General Electric Co., Detroit, was named manager of cemented carbide products engineering.

Worthington Corp., Harrison, N. J., appointed **E. W. Theilig** chief engineer of its power pump engineering department with headquarters at the Oil City Works and **R. K. Grobholz** manager of its reciprocating pump sales section at Oil City.

Carl C. Grotnes, president of **Grotnes Machine Works Inc.**, Chicago, is retiring after more than 40 years' service.

Daniel T. McFadden, assistant sales manager, was promoted to manager of sales, Atlantic division, **American Can Co.**, New York. He succeeds **George F. Henschel**, now general sales manager of the company.

J. H. HUMBERSTONE
. . . heads Air Reduction Sales Co.

J. H. Humberstone was elected president, **Air Reduction Sales Co.**, New York, to succeed **H. R. Salisbury**, retired. Mr. Humberstone, also a vice president of the parent firm, Air Reduction Co. Inc., has been serving as president of its Ohio Chemical & Surgical Equipment Division at Madison, Wis., and is succeeded in that post by **R. E. Lenhard**, former vice president of the division. Mr. Salisbury, who has held various management positions with Airco since 1926, continues as a director of its foreign subsidiaries, Air Reduction Canada Ltd. and Cuban Air Products Corp.

John Dunlop was appointed assistant manager of **Republic Steel Corp.'s** bolt and nut division, Cleveland. He succeeds **W. G. Holt** who left the company. A veteran of 15 years of service with the company, Mr. Dunlop was formerly assistant manager of operations of Reserve Mining Co., Babbitt, Minn., of which Republic is half-owner.

William J. Taylor succeeds **Ralph E. Winans**, retired, as purchasing director of **Detroit Bevel Gear Co.**, Detroit.

John F. Dreier was elected vice president-sales and **J. Henry Anthony** vice president-manufacturing at **Hart Mfg. Co.**, Hartford, Conn.

ROBERT UNDERHILL
. . . Ohio Seamless Tube purchasing agent

Robert Underhill was named purchasing agent for **Ohio Seamless Tube Division**, Copperweld Steel Co., Shelby, O. He has acted as assistant purchasing agent since 1945. He succeeds the late **Daniel C. Reagan.**

Kenneth O. Williamson was made sales manager for **Osgood-General**, Marion, O. Formerly assistant sales manager, he succeeds **James S. Fortiner**, resigned.

Promotions in the machine division of **Osborn Mfg. Co.**, Cleveland, include: **Earl B. Smith**, former sales engineer in the Ohio and West Virginia territory, made assistant manager of the division. **J. Doyle Robbins**, former assistant to the vice president, replaces Mr. Smith in that territory. **Leonard N. McKibben** becomes sales engineer for the New England territory.

W. Howard Gamble was made warehouse division sales manager for **Tower Iron Works**, Providence, R. I.

Robert F. Elmiger is the new sales promotion manager of Carpenter Steel Co.'s **Alloy Tube Division**, Union, N. J. He continues as market analyst for the division, a position he has held since July, 1953.

J. Frank Mellema was appointed

THOMAS M. MURPHY
. . . appointment at Stewart-Warner

W. C. HALE JR.
. . . exec. v. p. of South Chester Tube

WILLIAM C. GOECKEL
. . . Snyder Tool & Eng. sales mgr.

controller of **Ford Motor Co.'s** aircraft engine division, Chicago, to replace **Ralph H. Hetrick**, resigned.

Thomas M. Murphy was made manager of industrial sales of the Alemite Division of **Stewart-Warner Corp.**, Chicago, to succeed **E. Ralph Harris** who becomes distributor of Alemite lubrication products and Stewart-Warner instruments at St. Louis. Mr. Murphy has been a factory sales representative in the industrial sales department since 1947.

Charles E. Topping was appointed purchasing agent of **Luria Engineering Co.** with headquarters at the company's fabricating plant in Bethlehem, Pa. He has been with the Luria organization for the last eight years.

Arthur W. Johnson, former assistant chief engineer, Arms Franklin Corp., joined the engineering staff of **E. W. Bliss Co.'s** rolling mill division, Salem, O.

Hyman Marcus, chairman of the executive committee of **United States Hoffman Machinery Corp.**, New York, was elected president to fill the vacancy created by resignation of **George E. Bowdoin** who continues in a consulting capacity.

W. C. Hale Jr. was elected executive vice president, **South Chester Tube Co.**, Chester, Pa., and its subsidiaries, South Chester Corp., Lester, Pa., and Chester Tidewater Terminal, Chester, Pa. He served for several years as vice president and general manager of South Chester Corp.

Frank W. Nelson, former assistant manager, was promoted to manager of **Garrett Supply Co.**, Los Angeles, a division of Garrett Corp. He succeeds **Frank W. Miles**, now a vice president.

Fred C. Foy, vice president-general manager, tar products division, **Koppers Co. Inc.**, Pittsburgh, was elected to the board of directors.

William C. Goeckel was appointed sales manager, **Snyder Tool & Engineering Co.**, Detroit. He has been assistant sales manager since 1951.

Bedford Foundry & Machine Co., Bedford, Ind., opened a sales office in Pittsburgh under direction of **Wallace MacDonald**. The new office is located in Room 1241, Oliver Bldg.

Metalwash Machinery Corp. appointed **Charles J. Auger** at Detroit its representative in Michigan and **Frank J. Johnson** in metropolitan New York as well as northern New Jersey.

Guy Scrivener heads the newly organized municipal sales department of **Le Roi Co.**, Milwaukee. He is responsible for the sale of engines for use chiefly to drive stand-by generator sets and power centrifugal pumps.

J. R. Connell was appointed assistant general purchasing agent, boiler division, **Babcock & Wilcox Co.**, Barberton, O. He was formerly assistant purchasing agent, tubular products division, Beaver Falls, Pa. Also at the Barberton works, boiler division, **E. P. Moriarity, C. B. Warner, J. E. L. MacAdam** and **G. A. Wiedersheim** were made assistant purchasing agents.

Minneapolis-Honeywell Regulator Co. appointed **Merritt Eusey** manager of its Pittsburgh office. Former head of the Baltimore branch, he succeeds **Ray Weikel** who assumes a supervisory position with Honeywell's industrial division in Philadelphia. **Robert S. Warnick** replaces Mr. Eusey at Baltimore, and **Donald H. Hannasch** fills the newly created position of district manager at Greensboro, N.C.

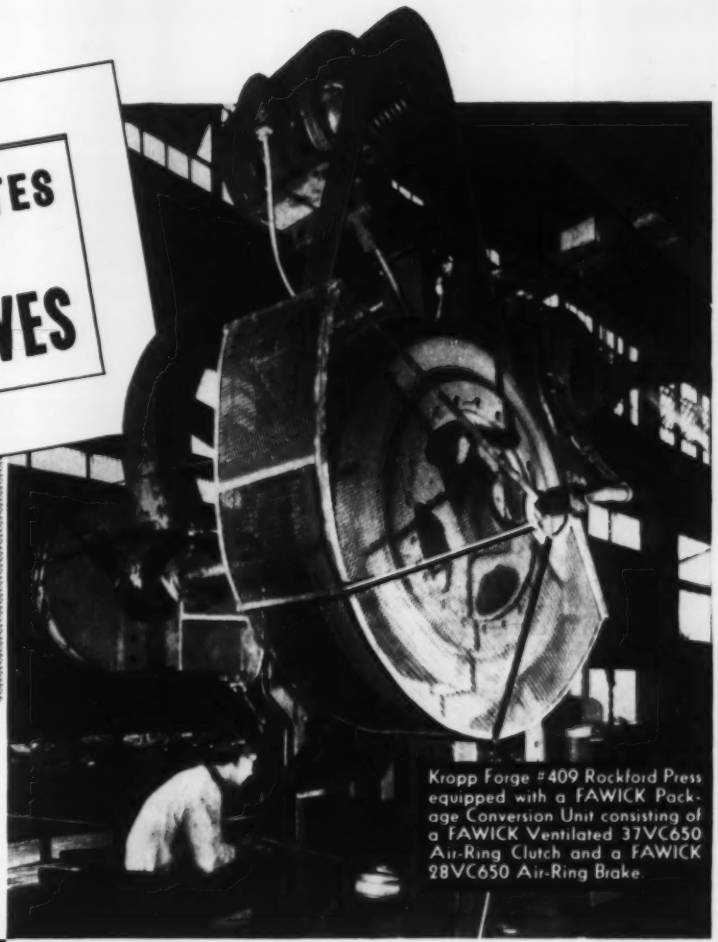
S. R. Hollingsworth was made manager, metal division, Cincinnati branch, **National Lead Co. C. J. Surman** was made manager, paint division, and **W. W. Howard** manager, pigments division. **H. W. Hundley**, manager of the Cincinnati branch since 1943, retired.

Frank T. Clarke was made sales manager, Boston district office, **American Steel & Wire Division**, U. S. Steel Corp. He succeeds **A. N. Murdock**, retired. Since 1949 Mr. Clarke has served in New York as manager of manufacturers' products.

R. L. Bobo was appointed Great Lakes regional manager for **Federal Electric Products Co.** and its subsidiary, **Pacific Electric Mfg. Corp.**;

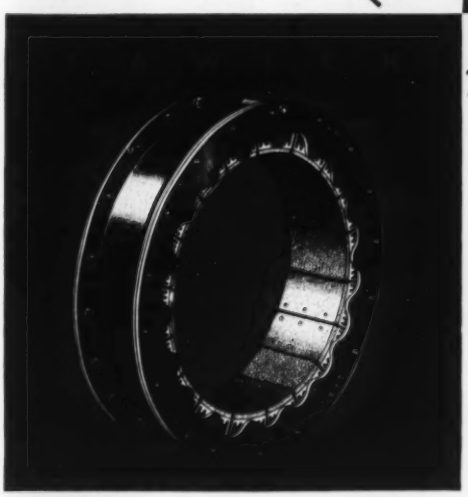
THREE QUICK NOTES FOR BUSY EXECUTIVES

1 2 3



Kropp Forge #409 Rockford Press equipped with a FAWICK Package Conversion Unit consisting of a FAWICK Ventilated 37VC650 Air-Ring Clutch and a FAWICK 28VC650 Air-Ring Brake.

Photo courtesy of Kropp Forge Co.



The famous FAWICK completely ventilated Type VC Air-Ring Clutch which features (1) cooler operation inherent in drum clutch design, (2) isolation of the operating tube from the heat-generating friction surface, (3) riveted, replaceable friction lining, and (4) loose, expanding operating tube which can be replaced without removing the clutch from the shaft.

1 FAWICK Advanced-Engineering *pays off* for industry . . . pays off by increasing machine productivity and by improving machine performance . . . pays off with increased safety to both machines and men.

2 FAWICK Airflex Clutches and Brakes have proved *by performance* that they provide more operating advantages because of their exclusive design.

3 The complete facilities of the FAWICK Engineering Service are available to show the practical advantages of FAWICK Airflex Clutches and Brakes as applied to specific power transmission problems.

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VAS PEICKII
. . . Micromatic Hone factory mgr.

C. P. MASURE
. . . purchasing agent at Lindberg Eng.

headquarters for Federal-Pacific's newly formed Great Lakes region is in Cleveland.

Frank L. LaQue was elected vice president, **International Nickel Co. Inc.**, New York, and manager of its development and research division. He succeeds in both positions **Thomas H. Wickenden** who has attained retirement age but who continues as a consultant on special projects. **O. B. J. Fraser** and **Donald J. Reese** will serve as assistant managers of the division.

Joseph F. Chalupa was appointed assistant works manager, aviation gas turbine division, **Westinghouse Electric Corp.** He is in charge of plant operations at the division's South Philadelphia, Pa., plant.

Col. Horace A. Quinn, U. S. A., ret., was named manager of **American Machine & Foundry Co.'s** general engineering laboratories in Greenwich, Conn. He succeeds **R. A. Kimes**, recently named director of engineering of the electronics division at Boston.

R. C. Allen was made director of mechanical engineering and **L. J. Linde** director of electrical engineering in the general machinery division of **Allis-Chalmers Mfg. Co.**, Milwaukee.

Lew E. Wallace, assistant vice president in charge of sales for **Youngstown Sheet & Tube Co.**, Youngstown, retired after 39 years of service.

Micromatic Hone Corp. appointed **Vas Peickii** factory manager of its Los Angeles plant. He was a former partner of M. E. Engineering Co., Los Angeles, whose equipment and good will were purchased by Micromatic.

Alan D. Dauch was appointed vice president of sales of **Salem-Brosius Inc.**, Pittsburgh, and of its recently acquired subsidiary, **George J. Hagan Co.** In addition he continues as vice president in charge of activities of the Hagan organization. **John W. Holzwarth** is manager of sales of heavy heating furnaces for the steel and nonferrous metals producing and fabricating industries and of all mechanical products. He has headquarters in Salem, O. **Charles H. Schwerin** was named manager of sales, rotary hearth furnaces and all heat treating furnace equipment, with headquarters at the Hagan offices, Pittsburgh.

E. G. Metz was made manager, purchasing and supply division, **Isthmian Steamship Co.**, New York.

Kenneth M. Stevens was elected a vice president and **H. F. Buckman** secretary and a director of **Powers Regulator Co.**, Skokie, Ill.

Crawford B. Murton, formerly sales representative for Kaiser Aluminum & Chemical Sales Inc.'s refractory division, joined the sales department of **Vesuvius Crucible Co.**, Swissvale, Pa.

Lindberg Engineering Co., Chicago, appointed **C. P. Masure** purchasing agent of its field-erected equipment division. He recently resigned from Continental Industrial Engineers Inc.

Armco Steel Corp.'s subsidiary, **Armco Drainage & Metal Products Inc.**, appointed **Max H. Bailey** division sales engineer, Calco Division, with headquarters at Berkeley, Calif.; **O. M. Carter** state sales manager for Mississippi and Arkansas with headquarters at Memphis, Tenn.; and **Crosby W. Bean** to succeed Mr. Carter as division sales engineer, southwestern division.

T. C. Gray was elected vice president-engineering at **Pullman-Standard Car Mfg. Co.**, Chicago. He has been director of engineering.

F. A. Gruetjen was named to a new post of director of aeronautical development at **A. O. Smith Corp.**, Milwaukee.

Changes in the sales department of **Aluminum Co. of America** include: **William B. Howard**, acting sales manager, Pittsburgh district, now named to handle special assignments for the sales vice presidents, with headquarters in Pittsburgh; **Samuel J. Simmons Jr.**, Worcester, Mass., sales manager, now Pittsburgh district sales manager; **Edward G. Cahill**, branch manager of the Syracuse, N. Y., office, named assistant district

V.I.P. treatment

You won't find it described in the books on metallurgy. But it's a mighty important factor here at Claymont in supplying you with carbon and alloy steel plates that are tailored to your specialized requirements.

To us it means *Very Important Plates.* It means individualized supervision of your order . . . particular attention to every detail of analysis, processing and inspection—right down the line from top to bottom.

Let us know your requirements—large or small. Our location in the heart of the Delaware Valley gives us complete access to convenient rail, water and highway transportation . . . enables us to efficiently and economically serve your needs.

CF&I

Claymont Steel Products

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

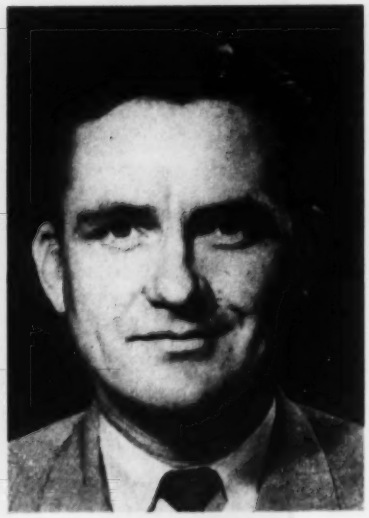
2283

ABILENE • ALBUQUERQUE • AMARILLO • ATLANTA • BOISE • BOSTON • BUFFALO • BUTTE • CASPER • CHICAGO • DENVER • DETROIT • EL PASO • FT. WORTH
HOUSTON • LINCOLN • LOS ANGELES • NEW ORLEANS • NEW YORK • OAKLAND • ODESSA • OKLAHOMA CITY • PHILADELPHIA • PHOENIX • PORTLAND • PUEBLO
SALT LAKE CITY • SAN FRANCISCO • SEATTLE • SPOKANE • TULSA • WICHITA • *Canadian Representatives At* • EDMONTON • TORONTO • VANCOUVER • WINNIPEG

OTHER CLAYMONT PRODUCTS

Flanged and Dished Heads • Manhole Fittings and Covers
Stainless Clad Plates • Large Diameter Welded Steel Pipe

ERIC W. PETERSON
. . . American Safety Razor mfg. director



WALTER W. BOLTON
. . . heads Dryomatic Corp.

WILDER MOFFATT
. . . Bonney Forge projects engineer

sales manager, Cleveland district; **C. A. Yeaton**, assistant New York district sales manager, named branch manager at Syracuse; and **Ralph E. Smith** named branch manager at Worcester.

American Safety Razor Corp., New York, appointed **Eric W. Peterson** director of manufacturing. He formerly was general manager of the ASR-operated Kingsbury Ordnance plant in La Porte, Ind.

Columbus Bolt & Forging Co., Columbus, O., named **Howard R. Rusk** manager of its Chicago district sales. He is replaced as sales manager in the Columbus office by **Jack L. Hindes**, formerly production manager.

C. C. Penske, for the last 14 months vice president-sales for Harper Mfg. Co., was named sales manager of **Meilink Steel Safe Co.**, Toledo, O.

Charles R. Wirth was named district representative by **Eclipse Fuel Engineering Co.** for its newly established West Coast district office located at Glendale, Calif.

Walter W. Bolton succeeds **W. B. Heinz** as president of **Dryomatic Corp.**, Alexandria, Va. Mr. Heinz continues to serve on the board of directors. Mr. Bolton, prior to joining Dryomatic, was affiliated with DuPont at its Savannah river atomic energy project.

R. M. Hollingshead Corp., Camden, N. J., appointed **Reid W. Malcolm Jr.** director of research and development to succeed **Albert E. Moore**, former vice president-research.

William G. Miller was elected president and **Stephen G. Harwood** vice president of **Montreal Locomotive Works Ltd.**, Montreal, Que.

Stuart N. Smith was made works manager, aviation division, **Twin Coach Co.** in Buffalo.

W. Hamilton Walter, until recently assistant chief of Mutual Security Agency in Great Britain, was named sales manager of **Electric Regulator Corp.**, Norwalk, Conn. Before joining MSA in 1950 he was co-ordinator of sales for Raytheon Mfg. Co.

Wilder Moffatt, design engineer at **Bonney Forge & Tool Works**, Allentown, Pa., for the last eight years, was named projects engineer. He will co-ordinate a program involving manufacturing and quality control, research and development, and analysis of machinery and equipment.

Malcolm O. Douglas is manager of the recently established sales department for Montrose Division, **Bendix Aviation Corp.**, Binghamton, N. Y.

Carpenter Steel Co. promoted **Paul Holtz** from manager, Chicago mill branch warehouse, to assistant Chicago district manager. He also will head sales and service in the St. Louis area.

C. G. Adler was made manager of the Graham, W. Va., plant of **Vanadium Corp. of America.**

At **Solar Aircraft Co.'s** San Diego, Calif., plant **R. H. McDaniel** was named general production superintendent, manufacturing division, and **L. C. Rothchild** assistant general production superintendent.

OBITUARIES . . .

Joseph Nagel, 56, president, **Nagel Metal Spinning & Mfg. Co.** and **Aero Tool & Die Co.**, Buffalo, died May 30.

Warren L. Hoagland, retired vice president and director, **Smith-Corona Inc.**, Syracuse, N. Y., died May 24 while on a European cruise. He had retired January, 1953.

William L. Acker, 72, founder and chairman of **Acker Drill Co. Inc.**, Scranton, Pa., died May 26.

Donald C. Leo, 51, secretary and general attorney of **Universal Atlas Cement Co.**, New York, a U. S. Steel Corp. subsidiary, died May 22.

Frank E. Mueller, 73, retired president of **Roberts & Schaefer Co.**, Chicago, died May 18.

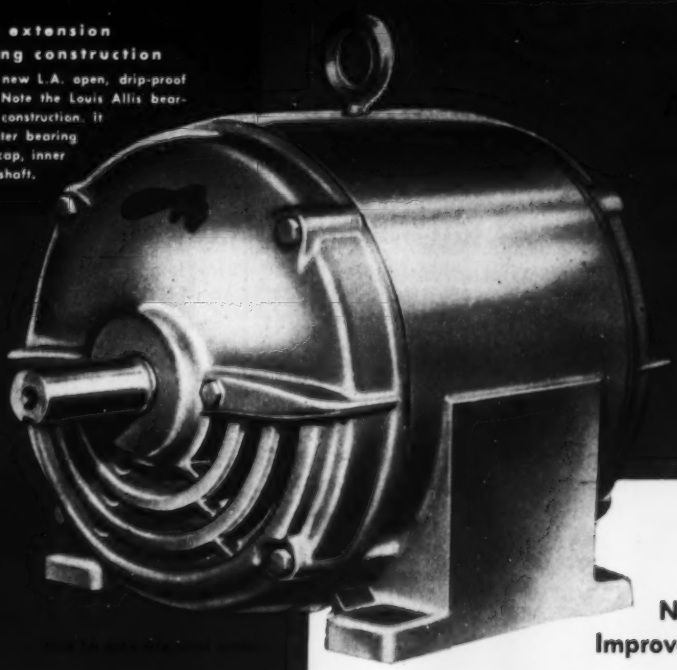
Alfred W. Ward, chairman of **Brooks Oil Co.**, Pittsburgh, and former president, died at his home in Cleveland May 28.

Here's another reason why

the NEW L.A. *Line*

by the Louis Allis Co.

is your BEST *electric motor* BUY



Shaft extension bearing construction used in new L.A. open, drip-proof motors. Note the Louis Allis bearing-cap construction. It locks outer bearing race to cap, inner race to shaft.

A brand-new power package, completely redesigned inside and out

with NEW BEARING CONSTRUCTION

plus

New modern styling
More compact design
New conduit box arrangement
Improved ventilation and better protection
More versatile mounting

HERE'S the locked bearing construction that makes the new L.A. motors even better—gives them extra life, extra dependability. It positions the rotor . . . limits shaft end-play . . . gives you ample V-belt drive capacity. You get factory prelubrication, too, with a new, improved grease-retaining system that saves servicing and maintenance — for years of attention-free operation under most conditions.

That's not all! You get standard bearings in every unit — sizes specially selected to be easily obtainable from local stocks. And there's no need to tear the motor down to get bearing numbers — they're stamped right on the new motor nameplate.

Add this modern, dependable bearing construction to all the other features and you see why the L.A. line is your best motor buy. Get the complete story from your nearby Louis Allis Sales Engineer.

We specialize in
SPECIAL MOTORS *and*
PROMPT DELIVERY, TOO

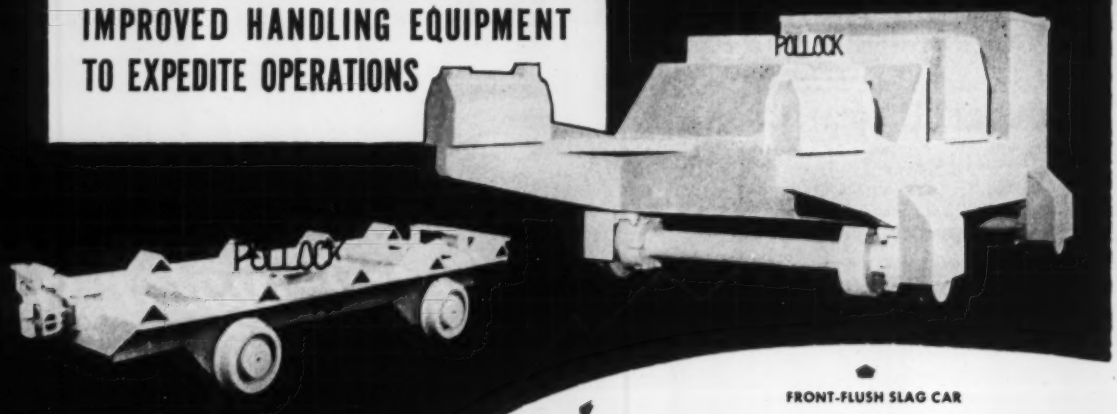
NEMA C-flange motor

THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN

LA-105

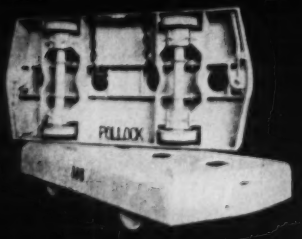
POLLOCK

IMPROVED HANDLING EQUIPMENT TO EXPEDITE OPERATIONS

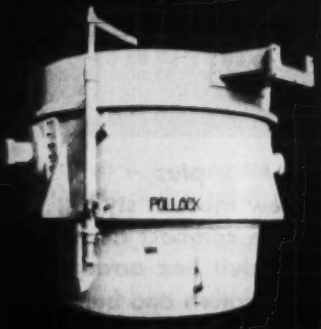


FRONT-FLUSH SLAG CAR

CHARGING BOX CAR



INGOT CAR



OPEN HEARTH LADLE

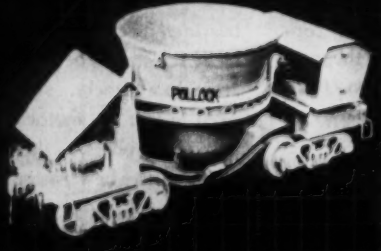
SLAG CAR

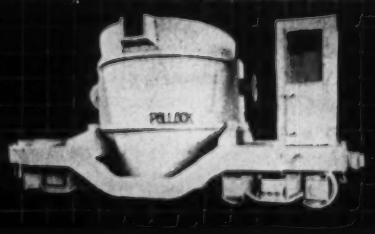
an important factor in increased open hearth production

• Pollock experience in the development and construction of open hearth equipment assures smooth flow of operations. To measure use-value of Pollock handling equipment, add their day by day engineering research to 85 years of producing for the steel industry. General specifications available on request. Special-performance details engineered for your needs.

DRAG-OUT SLAG CAR

HOT METAL TRANSFER CAR





POLLOCK
SINCE 1863

THE WILLIAM P. POLLOCK COMPANY
YOUNGSTOWN • OHIO

STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • FOUNDERS

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

Elgin Anodizing Aluminum

Establishes plant at its Wadsworth Watch Case Division to use process

AN ALUMINUM anodizing plant has been established by Elgin National Watch Co., Elgin, Ill., as part of its Wadsworth Watch Case Division, Dayton, Ky.

Anodizing is an electrolytic process for placing a protective oxide coating on aluminum to make it resist corrosion and abrasion. The metal also can be dyed any desired color during anodizing. The process is being used by Elgin to give a rust-resistant coating to aluminum parts of high-precision ammunition components, as well as to decorative emblems for the automotive and home appliance field.

Although only 10 per cent of Wadsworth's emblem volume this year will be anodized aluminum, it is expected by 1956 to rank with plastic as one of the two most popular materials for emblems and nameplates, says J. G. Shennan, president of the company.

Steelcraft Changes Hands

Irvin A. and James F. Higgins, former sales managers of Baron Steel Co., Toledo, O., purchased Fulton Steelcraft Co., Swanton, O. The Steelcraft firm's regular line of machine work and fabrication will be continued by the new owners who will expand facilities for starting regular production of metal items.

Consolidated Western Builds

Consolidated Western Steel Division, U. S. Steel Corp., is constructing a 15,800-sq-ft building in Maywood, Calif., for fabrication of steel products.

Lead Fabricator Opens Plant

Andrews-Knapp Construction Co. Inc., New York, opened a new base of operations for lead fabrication and construction in Sisterville, W. Va., under the direction of George Downing. Andrews-Knapp is a wholly owned subsidiary of Knapp Mills Inc., New York, a leading producer of lead-clad steel and lead-clad copper, both of which are used extensively by the chemical industry and by the nuclear industries. Since lead lining of equipment and lead construction field work require steel tanks, towers, process vessels and structural steel components, arrangements have been made to co-operate closely with the Sisterville Tank & Boiler Works.

California Firm Expanding

Aviation Developments Inc. constructed a building at 210 S. Victory Blvd., Burbank, Calif., for manufacture of blind rivets, riveting equipment and Ardel sheet grippers.

Arwood Signs Factory Lease

Arwood Precision Casting Corp., New York, will occupy a 27,000-sq-ft factory being built at 3020 Vail Ave., Los Angeles. The plant will produce ferrous and nonferrous lightweight investment castings for the aircraft industry.

Continental Retooling Plant

Continental Aviation & Engineering Corp., Detroit, is tooling for production of gas turbines to be used in target drones produced by Ryan Aeronautical Co., San Diego, Calif. Production of the turbines is scheduled to start in October.

Garrett Enlarging Plant

Garrett Corp., Los Angeles, will build a $300,000 addition to the engineering section of the Phoenix, Ariz., plant of its division, AiResearch Mfg. Co. This authorization is in addition to the present Garrett facilities in Phoenix, including those under construction, which represent an outlay of over $10 million.

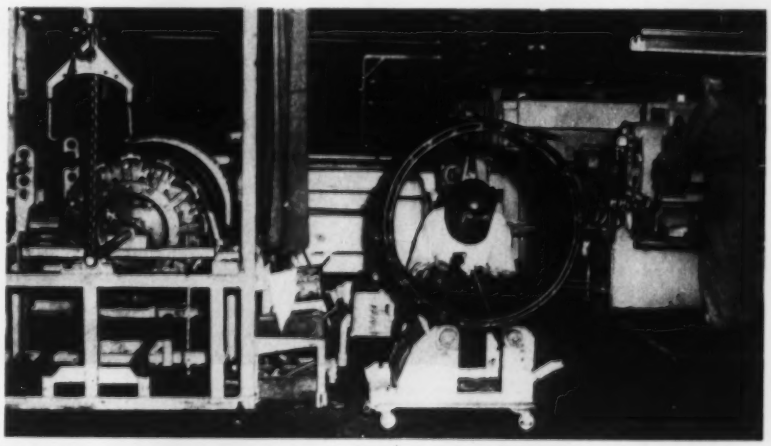
Eaton Creates Aircraft Unit

Eaton Mfg. Co., Cleveland, manufacturer of automotive and aircraft components, created an Aircraft Division. This division's offices and manufacturing areas will be adjacent to the firm's present Valve Division in Battle Creek, Mich. John F. Romans is general manager of the new division.

Sawhill To Move Plant

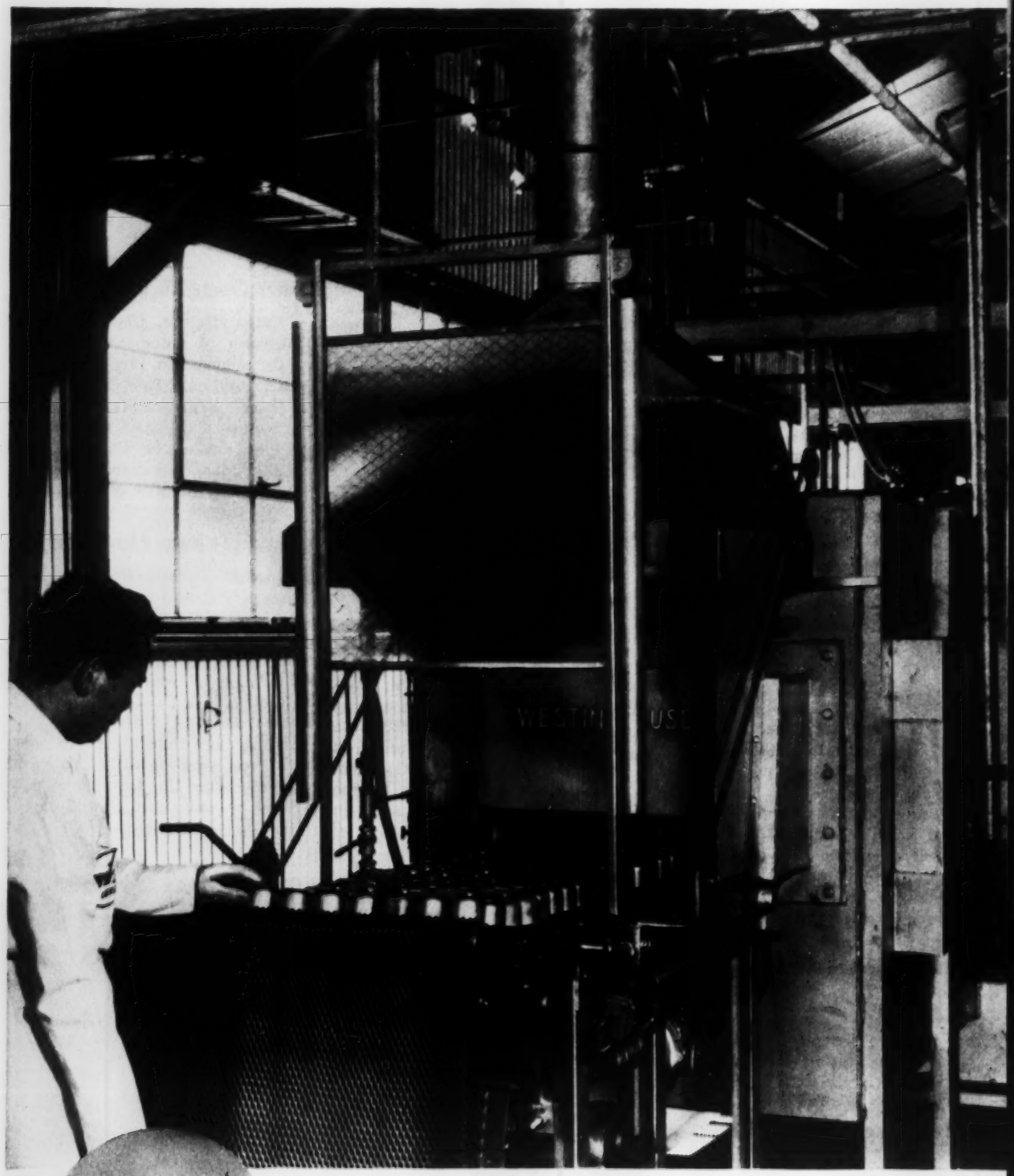
Sawhill Tubular Products Inc., Sharon, Pa., will move its Springfield, O., plant to Wheatland, Pa. All equipment will be installed by July 11. More than 200 employees are being allowed to transfer to Wheatland, says D. V. Sawhill, president. The Wheatland plant, costing more than $3 million, was put into operation early this year, shortly after the firm announced plans to unify the Sawhill Mfg.

(*Please turn to page* 100)



Efficiency Is Keynote of $2-million Plant's Layout

Raw materials, parts in process, finished products move smoothly through Vapor Heating Corp.'s $2-million plant in Niles, Ill. Machine on the right electrically welds steel pipe in 5 to 20 seconds. Twenty-four-foot sections of pipe are welded into 300-foot lengths. The machine on the left rolls the pipe into a coil on a collapsible jig. In the center, a welder places spacers between the coils



IF YOUR PRODUCT CALLS FOR HEAT-TREATING . . . IT CALLS FOR A WESTINGHOUSE FURNACE . . . *GAS OR ELECTRIC.*

"Production capacity increased 400% with Westinghouse Sintering Furnace"

. . . says Kwikset Locks, Inc.

As the largest producer of custom-molded powdered metal parts west of the Mississippi, Kwikset Locks, Inc., of Anaheim, California, has this to say about its Westinghouse Sintering Furnace:

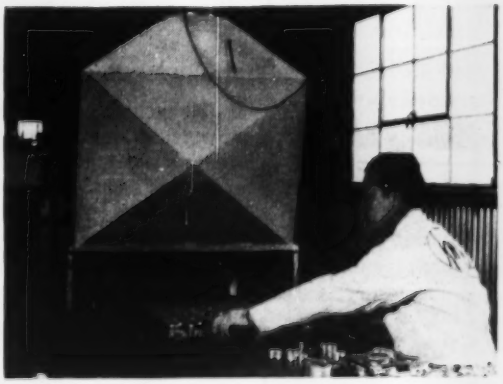
"We chose a Westinghouse Electric Belt Conveyor Furnace when desiring four times the production capacity formerly available. We now enjoy the desired protective atmosphere needed for top-quality control, gain excellent temperature control and response, and take advantage of fast Westinghouse engineering and repair service. We have found, through experience, that Westinghouse Furnaces are easy to operate.

"Our principal operation is sintering brass components for our residential and commercial lock sets. These parts were formerly machined from bar stock, precision cast or stamped. By converting to the sintering process with a Westinghouse Electric Belt Conveyor Furnace, we have eliminated scrap and machine finishing . . . thus increasing production and reducing costs."

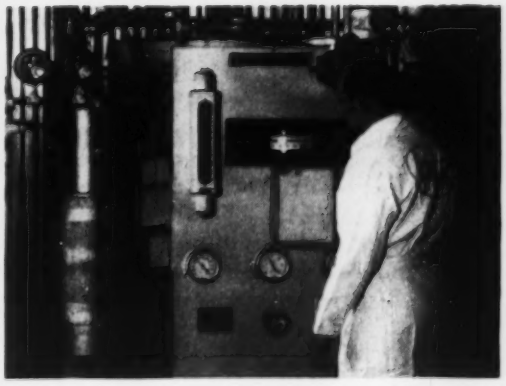
Why not investigate Westinghouse Heat-Treating Furnaces for your plant? A complete line covering every heat-treating job is available. Write for free book *Harnessing Heat* (B-5459). Westinghouse Electric Corporation, Industrial Heating Department, Meadville, Pa. J-10412

YOU CAN BE **SURE**... IF IT'S

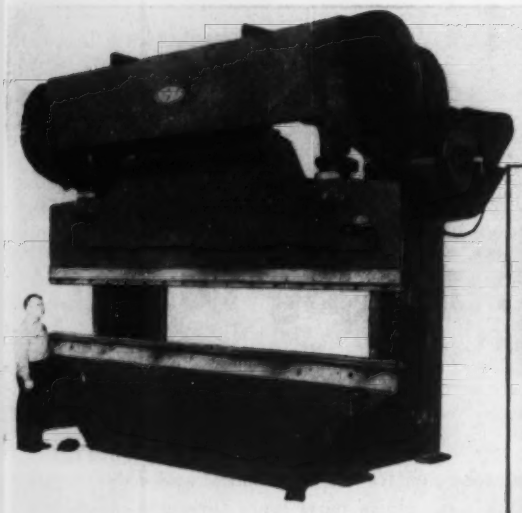
Westinghouse



The above shows the "briquettes" after they have left the cooling chamber where they have been cooled below oxidizing temperature. If unusually close tolerances are not involved, the pieces are used as sintered.



Shown above is the Westinghouse Ammogas® Atmosphere Generator (1500 cfh, 1850° F. max.) that gives Kwikset Locks, Inc., the desired atmosphere for top-quality control.



* Operations include forming, gang-punching of irregular and special shapes, channels, angles ...bending of bar, pipe, sheet... from mild steel plate up to 1/2" thick, 12', 6" long, and greater thicknesses in shorter lengths. Fabrications may be material handling, vats, alloy, bins and hoppers, tanks, vessels, boxes, frames, retorts, muffles ...and a hundred other custom-built products.

I AM A NEW MACHINE
ALL SET TO PRODUCE FOR YOU

The name, gentlemen, is Chicago Press Brake, and I have just been installed in the plant of Rolock Incorporated, Fairfield, Connecticut. They have asked me to speak for myself.

First of all, you can see that I'm a husky specimen . . . 17 ft. in height, 80,000 lbs. in weight . . . with a tremendous capacity for producing heavy work. I have joined the Rolock machinery group partly to lower costs and speed production of our fabricated heat and corrosion resistant alloys . . . and also to handle larger and stronger components for the chemical and food processing fields.

I shall be working with highly experienced engineers, fabricators and welders, who have made Rolock a top name for supplying engineered-to-the-job Heat Treating equipment for the country's leading metal working plants.

So, as the most versatile tool in any fabricating plant, Rolock is offering my products for the solution of your problems concerned with fabrications* you may require. Mr. Roger P. Welles, President of Rolock Incorporated, has suggested that you write to him, personally, for discussion of your needs . . . and, if desired, our engineering recommendations.

ROLOCK INCORPORATED
1262 KINGS HIGHWAY, FAIRFIELD, CONNECTICUT
SRL54B

(*Concluded from page 97*)

Co., Mercer Tube & Mfg. Co. and Shenango Agaloy Tube Co. under the name of Sawhill Tubular Products Inc. (STEEL, Jan. 11, p. 61).

Weirton Enlarges Department

Construction of an extension to the mixer building plus installation of a 150-ton capacity crane is expected to be completed this month at the open-hearth department of Weirton Steel Co., Weirton, W. Va.

Enters Thermostat Metal Field

American Silver Co. Inc., Flushing, N. Y., entered the thermostat metal field. Heading the Thermostat Metal Division is Stanley R. Hood.

Meldon Opens Warehouse

Meldon Steel Co., Brooklyn, N. Y., opened a warehouse in Syracuse to stock hot and cold-rolled steel sheets, hot-rolled plates, hot and cold-finished bars, structural angles, beams and channels. Jerry Giambra is manager.

M-N Metal Buys Pressmaker

M-N Metal Products Corp., Hazel Park, Mich., purchased Zeh & Hahnemann Co., Newark, N. J., producer of metalworking machines and presses. K. Stirling Movold is president of both companies.

Worthington Buys Mullenbach

Mullenbach Electrical Mfg. Co., Los Angeles, manufacturer of electrical controls, switches and panel boards, was acquired by Worthington Corp., New York, through its wholly owned subsidiary, Electric Machinery Mfg. Co., Minneapolis.

Myers Heads Cloyes Gear Works

Harry D. Myers of Cleveland purchased the controlling interest in Cloyes Gear Works Inc., that city, maker of automotive and industrial gears and sprockets. Mr. Myers is president and treasurer; Herbert Stebbins, vice president in charge of sales; and C. V. Laslo, vice president in charge of manufacturing.

one is always best

...and REX is the standard by which all high speed steels are compared

No matter how keen the competition, there can be only one winner. And the difference between the winner and the runner-up, whether it's golf or making high speed steels, is measured in performance.

Crucible REX® high speed steels have proved their championship qualities under the toughest sort of competition — in actual use in thousands of tool shops throughout the world. But check for yourself. Try a piece of REX high speed steel on your next job. Compare its hardenability, response to heat treatment, its fine tool performance. You won't find another high speed steel to outperform REX.

Ask for REX by name wherever high speed steels are sold. But remember, REX is made *only* by Crucible.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **TOOL STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.

HEVI DUTY.

TOOL ROOM COMBINATION

FOR YOUR HEAT TREATING OPERATION

A low cost furnace combination for scale-free heat treating. An atmosphere generator supplies a protective atmosphere to the preheat and the high temperature furnaces. Furnace temperatures are automatically and accurately controlled. A portable sectional quench tank is arranged for both brine or oil quenching.

TEMPERITE Used for tempering, drawing, and annealing where temperatures up to 1350° F. are required. A high speed fan forces the air to circulate around an alloy baffle and into the work chamber assuring rapid and uniform heating.

TREET-ALL An all purpose furnace with a maximum operating temperature of 1850° F. Gas tight construction and an alloy muffle permits the use of the usual types of controlled atmospheres. A roll-away quench tank is housed in the furnace stand.

ATMO-GEN Provides 75 C.F.H. of high quality low cost cracked ammonia atmosphere. The unit is simple to operate; push the start button and set the gas flow.

SPEED-TREET Used to heat treat high speed steels. Built to operate continuously at a maximum temperature of 2600° F. A gasketed door sealing against a ceramic muffle permits the use of a protective atmosphere.

If you desire, any unit of this combination can be furnished separately. Send today for more information. Bulletin 1147.

HEVI DUTY ELECTRIC COMPANY

HEAT TREATING FURNACES HEVI DUTY ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

MILWAUKEE 1, WISCONSIN

REPRESENTATIVES

Allegheny Ludlum Steel Corp., Pittsburgh, appointed Junger Steel & Supply Co., St. Paul, to sell its tool steel, bars, forgings and castings. This agency, formed recently by E. F. Junger and Fred F. Junger, has a warehouse at 1179 15th Ave., Minneapolis.

Cooper Alloy Foundry Co., Hillside, N. J., appointed James Wallace Jones, Montezuma, Ga., as district representative. The company makes valves, pipe fittings and other products.

Bohn Aluminum & Brass Corp., Detroit, appointed Benjamin Wolff & Co., Melrose Park, Ill., as distributor in the Chicago area for free-cutting brass rod. In addition to brass rod, Wolff carries a a complete line of ferrous and nonferrous metals.

Lodding Inc., Worcester, Mass., appointed as its representatives in their respective territories for the sale of jig and fixture components Western Tool & Supply Co., Oakland, Calif.; Precision Tool Sales, Los Angeles; and DeEugenio Tool Center, Phoenix, Ariz. Lodding also opened a branch office at 1904 Brown St., Dayton, O., under the direction of Lee Weber.

Pyramid Steel Co., Cleveland, appointed Don D. Fleming Co. Inc., San Francisco, as distributor of its tool and die steels in Northern California and Nevada.

Mercury Mfg. Co., Chicago, appointed McKinley Equipment Co. to represent the company in the Los Angeles area. The firm makes materials handling equipment.

Precision Tool Sales Division, Western Standard Co., Los Angeles, was named Southern California distributor for **Boice Mfg. Co.**, New York, manufacturer of gage equipment.

Industrial & Contractors Equipment Corp. opened sales, parts and service facilities at 4103 Brookpark Rd., Cleveland, as di-

(*Please turn to page* 106)

*REO DESIGN ENGINEERS SAID...

TOUGH JOB?

WE'LL SPECIFY

STRESSPROOF®

SEVERELY COLD-WORKED, FURNACE-TREATED STEEL BARS

AGAIN!

*Reo Motors, Lansing, Mich., have again specified STRESSPROOF—this time for the power shaft on their new rotary lawn mower.

Another
Reo Lawn Mower
to Use STRESSPROOF

Reo engineers needed *top performance* from this new drive shaft . . . so they insisted on STRESSPROOF! They knew from years of successful experience with STRESSPROOF that it could take abuse. It had both the strength and wearability to stand up under the toughest service—and its excellent machinability was most welcome from a cost standpoint.

The alternative to STRESSPROOF would have been a heat-treated part, with the attendant cleaning, straightening, and machining problems.

Only STRESSPROOF gives you a unique combination of four qualities *in-the-bar:* Strength, Wearability, Machinability, and Minimum Warpage. Yet it costs less than the other quality cold-finished steel bars.

STRESSPROOF makes a better part at lower cost! It is available in cold-drawn or ground and polished finish.

SEND FOR . . .
Free Engineering Bulletin
"New Economies in the Use of Steel Bars"

La Salle STEEL CO.

Manufacturers of the Most Complete Line of Carbon and Alloy Cold-Finished and Ground and Polished Steel Bars in America.

La Salle Steel Co.
1414 150th Street
Hammond, Indiana

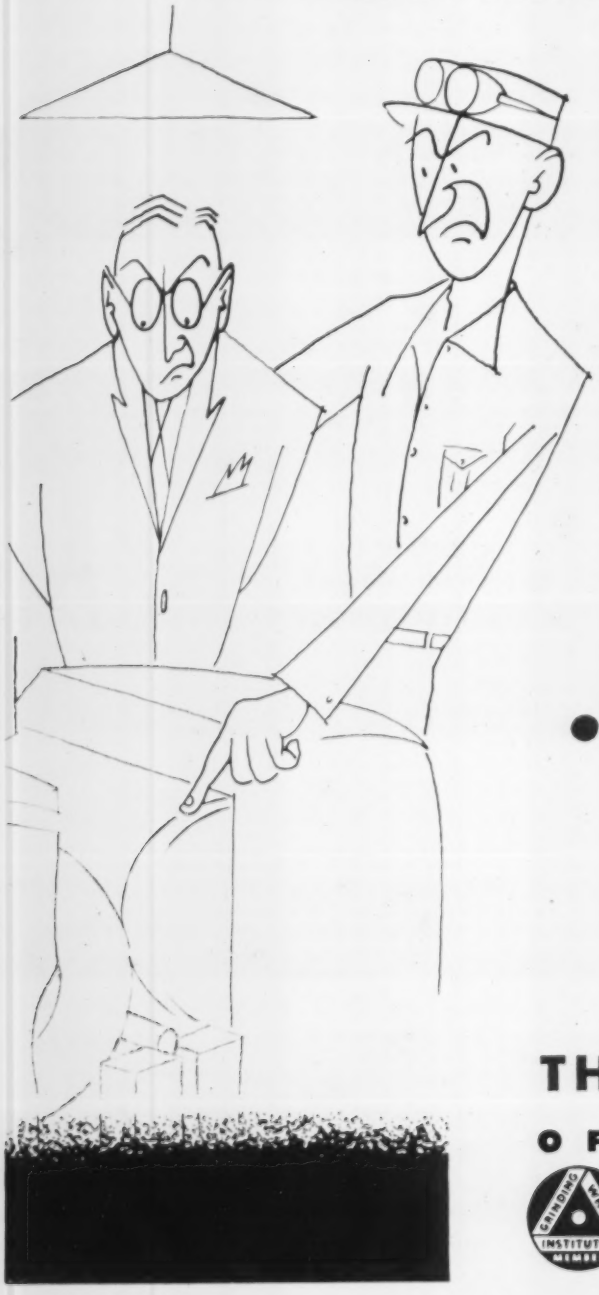
Please send me your STRESSPROOF Bulletin.

Name_____
Title_____
Company_____
Address_____
City_____ Zone___ State_____

ONE OF A SERIES OF ADVERTISEMENTS TELLING YOU

A LOADED WHEEL GATHERS

BUT THE CORRECT STERLING SPECIFICATIONS SAVE YOU



Many grinding wheels load with the metal being ground. Others glaze. Between these two types of wrong wheels is hidden the grinding specification that is just right. Finding that specification is a tough job, but Sterling engineers and technicians are doing it time and time again—can do it for you!

The difference between the right and wrong specification can be the difference between making and losing money on your grinding operations. The correct Sterling specification costs you no more, but it does take extra study to produce it. It is this study that makes the difference. It creates the "Wheels of Industry" that are naturally the best you can use.

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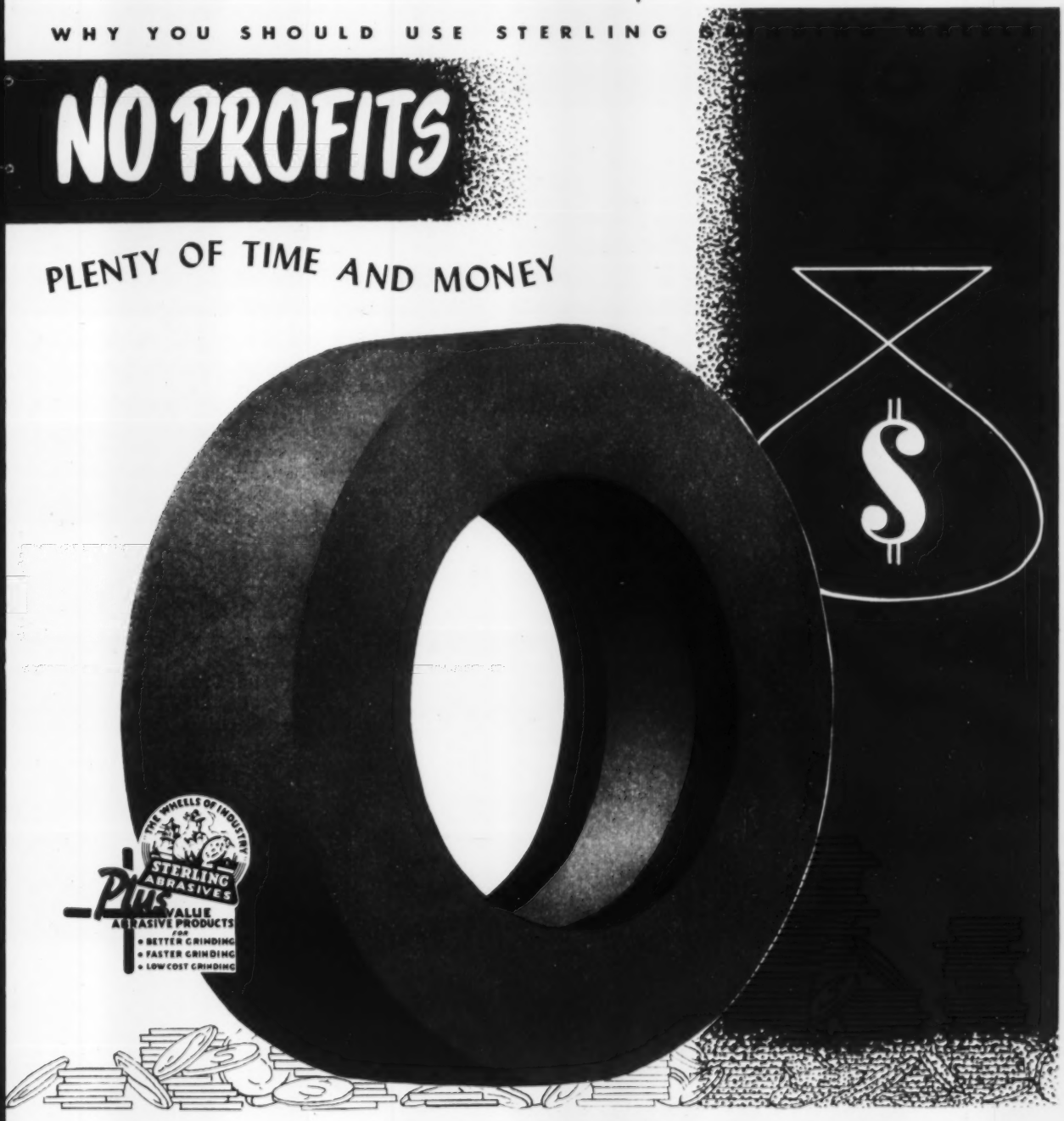

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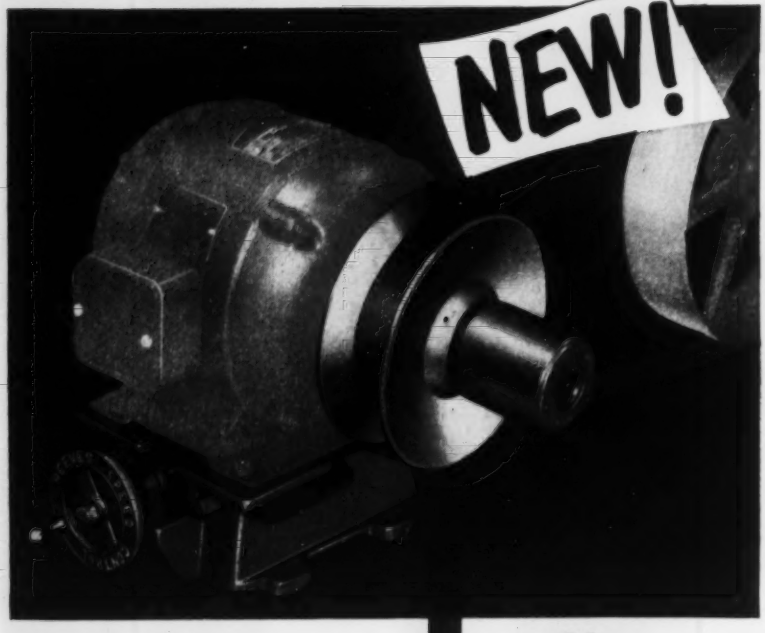

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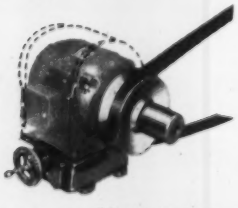

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(*Concluded from page* 102)

rect factory representative for **American Steel & Wire Division, United States Steel Corp.; Champion Rivet Co.; Clark Equipment Co.; Dempster Bros. Inc.; Owen Bucket Co.; Page Engineering Co.; Talbert Construction Equipment Co.;** and others.

ANNIVERSARIES

Steel Supply Co., Chicago, is celebrating the 50th anniversary of its founding this year. The firm furnishes turned, ground and polished steel shafting to the machine tool trade and carries a complete line of cold-drawn rounds, squares, flats and hexagon shapes. Martin O. Hjortland, president, says larger quarters for the firm are in prospect.

NEW ADDRESSES

Leeds & Northrup Co., Philadelphia, moved its Cleveland office to 1922 E. 107th St. The company makes electrical measuring instruments, automatic controls and heat-treating furnaces.

Exothermic Alloys Sales & Service Inc., Bridgeville, Pa., opened a West Coast office. The mailing address is Box 201, South San Francisco, Calif.

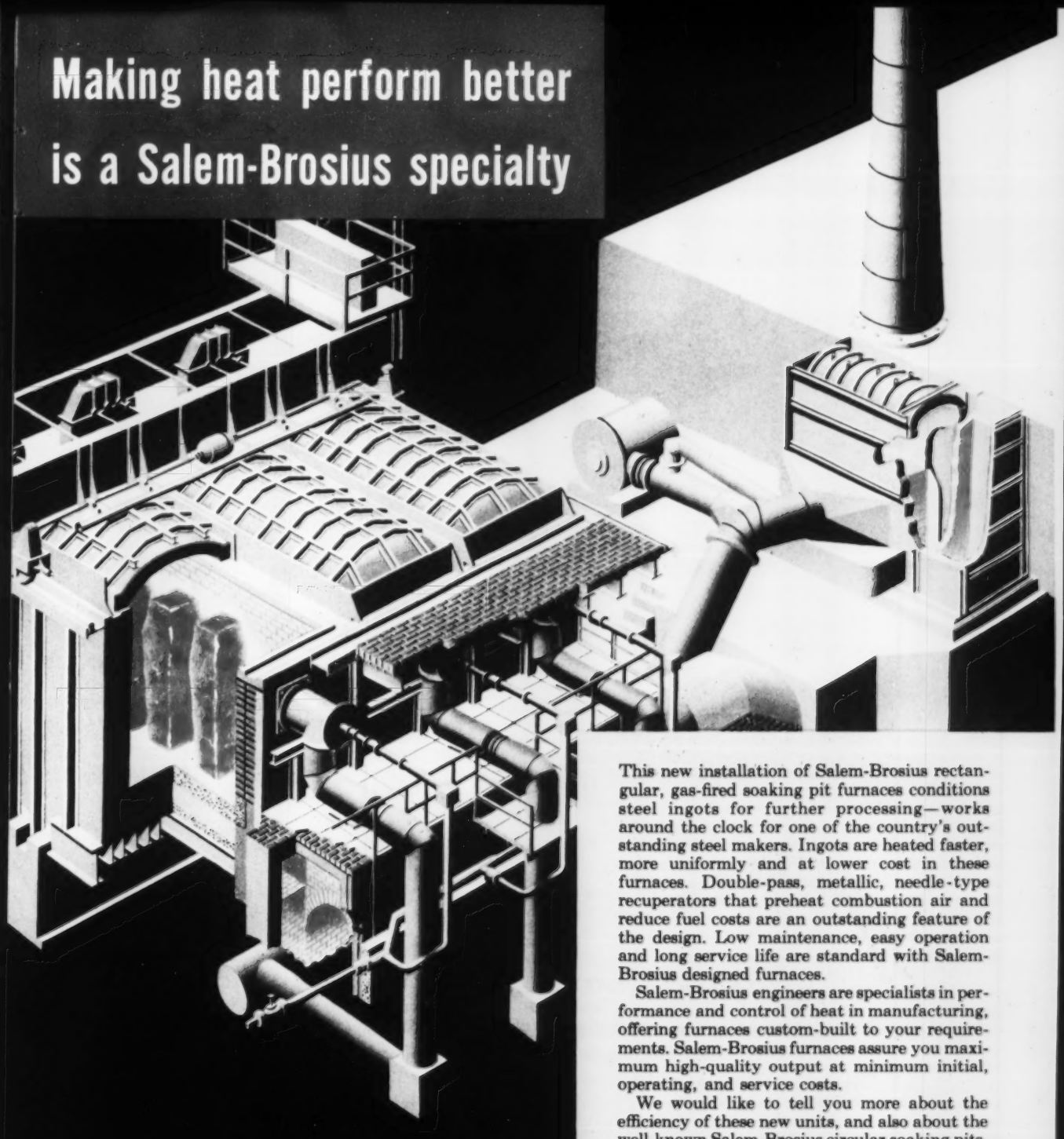
Camcar Screw & Mfg. Corp., Rockford, Ill., manufacturer of metal fasteners, opened a district office at 16239 James Couzens Highway, Detroit.

ASSOCIATIONS

Iron & Steel Institute, London, England, elected R. G. Lyttelton as president. Dr. T. P. Colclough is the recipient of the institute's Bessemer Medal, presented at the annual meeting last month.

Herbert Harig, vice president of Harig Mfg. Corp., Chicago, was elected secretary of **National Tool & Die Manufacturers Association,** Cleveland.

Making heat perform better is a Salem-Brosius specialty



This new installation of Salem-Brosius rectangular, gas-fired soaking pit furnaces conditions steel ingots for further processing—works around the clock for one of the country's outstanding steel makers. Ingots are heated faster, more uniformly and at lower cost in these furnaces. Double-pass, metallic, needle-type recuperators that preheat combustion air and reduce fuel costs are an outstanding feature of the design. Low maintenance, easy operation and long service life are standard with Salem-Brosius designed furnaces.

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STEEL

June 14, 1954

Technical Outlook

HIGH-TEMPERATURE STAINLESS— Keep an eye on alloys being developed by the Cornell Aeronautical Laboratory for the Navy Bureau of Aeronautics. Basically chrome-nickel types, they are modified with small additions of titanium and boron. Program is aimed at finding replacements for scarce materials used in jet aircraft service.

AUTOMATED ECONOMY— The machining line for D-8 track links at Caterpillar Tractor Co.'s new York, Pa., plant is highly mechanized. Machines are all automatic cycled, and they're linked by automatic conveyors. Whole line requires five operators. Line for the same operations at the Peoria, Ill., plant employs about 15 men—and Caterpillar engineers expect the York line to produce about 50 per cent more parts per day than the other line.

TESTING— A major brewing company is using x-ray to check the fill level in cans as they speed along the line. The beam is aimed at the correct level and is absorbed by the liquid if the fill is proper. Otherwise, x-rays pass through the can and hit a detector on the other side of the line. It actuates an air system that blows faulty cans off the line.

ALUMINUM— Within the year, you can expect Alcoa to announce two high temperature alloys. One is a cast alloy, the other, a wrought alloy.

PRESTRESSED CONCRETE— Studies of high tensile steel wire used in this application reveal: 1. Of the salts likely to be found in soils or ground waters, only nitrates seem to cause stress corrosion failure. 2. Hard drawn wire is better than oil-tempered wire because it is less sensitive to stress corrosion, and 3. Since all high strength steel wire must be protected adequately against any type of corrosion, stress corrosion failure may be expected only in cases where such general protection breaks down. So the AISI was told recently in New York by Walter O. Everling, director of research, American Steel and Wire Division, U.S. Steel Corp.

BOILERMAKER'S EAR— Deafness is on the uptrend because we are living longer and become more susceptible to hearing difficulties and because industry is getting noisier. That was the consensus at the National Safety Show in Chicago. It was pointed out that one of the most widespread causes of hearing impairment, especially among those between 20 and 30, is the loud and continuous factory noise.

PLASTICS— "Plastic tool makers are not competing with hard metal stampers, but will tend to widen the market for the metalworking industry." So stated William R. Weaver, Modern Pattern and Plastics Inc., before a recent meeting of the Pressed Metal Institute in New York. He reasoned that new opportunities for the metal industry will emerge as inexpensively fabricated plastic tools demonstrate the practicability of many jobs that would be prohibitively expensive to tackle experimentally with machined metal tools.

LIGHTER TITANIUM— New alloy developed by Watertown Arsenal is said to be 40 per cent lighter than high-strength steel. Tensiles go up to 192,000 psi, and the material can be formed much more easily than other commercial alloys. Properties are compared with steel used to make heavy weapons, tanks and armor plate.

PLASTICS— A polyvinyl chloride material, called Boltaron 6200, can be worked about like sheet iron. It can be cut, formed, welded, ground and machined to close tolerances and drawn with simple dies, according to the producer, H. N. Hartwell & Son Inc., Boston. Material is about half as heavy as aluminum.

Metalworking Outlook—p. 59 *Market Outlook—p. 155*

TRAVELING STOCKROOM

Men in stockroom load trays with parts and subassemblies. Fully loaded, system carries work for 4 hours' assembly work. Letter-numbers identify parts

Here's what its traveling stockroom conveyor means to Eastman-Kodak by way of production advantages:

1. Less Space—About half what would be required to do the same job without the system.
2. Lower Costs—Requires less than half the handlers that would be essential in usual assembly area.
3. Greater Production Flexibility—Increases in schedules require no rearrangement in existing setup.
4. Less Scrap—Damage through handling and stockpiling is reduced because no parts are stored on or beneath assembly benches.
5. Less Inventory Time—Conveyorized items can be inventoried in 15 minutes—approximate time for conveyor to make a complete turn.
6. Less Waiting—Employees set their own pace. No one waits for work from a previous operator because there's sufficient supply on the conveyor.
7. Less Supervision—Foremen can see at a glance how work is progressing. They assign alternative jobs quickly and never chase materials.

Carrousel For Parts' Handling

Eastman's conveyorized supply of parts from stockroom halves space requirements. It rids assembly of such inflexible factors as operation sequence

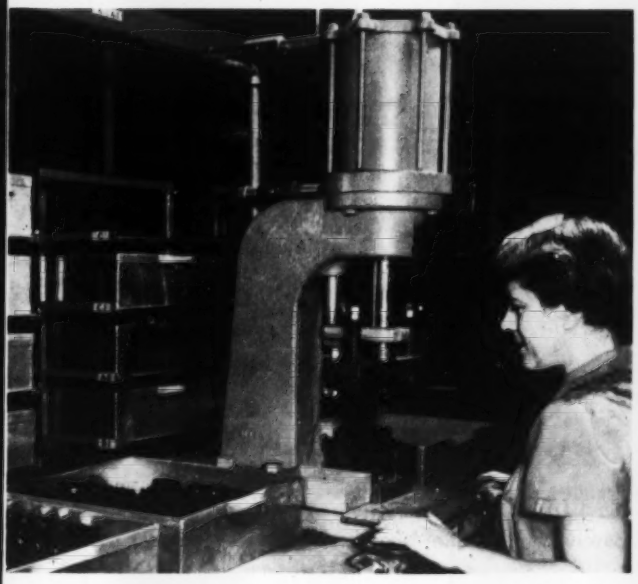
ABILITY to get parts and subassemblies from stockroom and storage to assembly at the right time all the time can add substantially to over-all profit. Eastman-Kodak Co.'s parts handling setup does this job, and also takes care of a multitude of other production and handling ills along the way.

In 1946, Eastman designed and installed its first traveling stockroom conveyor. Called the carrousel by Kodak employees, it was used for Baby Brownie camera assembly.

The conveyor paid for itself so quickly that five more such systems have been installed. Four of the six conveyors are used in camera assembly. The other two serve flash holder and film magazine assembly.

Space Saver — While Kodak doesn't claim to have solved all its production and materials handling problems, the system does have some significant advantages. Among these is the carrousel's function as a space saver. Company engineers estimate that doing the same job without the conveyor system would require double the floor space now used.

They point out the need, under a conventional work bench system, for wider aisles between benches to allow trucking from stock areas and for wider and longer bench surface to hold stock. Problems of a manufacturing area cut up by posts and other obstacles also



Operator knows, if she misses one tray, another will pass in about a minute on carrier moving at about 25 fpm. She removes the entire aluminum or fiber tray

No sequence of operations here. Workers can be placed along the carrousel in any spot where outlets are available. Three feet of space anywhere can take an operator

vanish with the carrousel conveyor system. The conveyor can go around corners and into small areas that can't otherwise be used in a long bench with its sequence of operations.

Location Sequence—One of the most attractive features of the conveyor system is its versatility. There's no concern about location sequence. Workers can be placed along the conveyor in any convenient spot where service outlets are available. This is possible because the second operation does not need to be adjacent to the first, or the third adjacent to the second.

An operator can be shifted from one job to another easily. Inspectors can be separated from incentive works, if that is desirable. Operators are deliberately spread around, making for more uniform supply.

For example, eight or nine operators, all doing the same job, are spotted at various points—equally supplied. On a conventional system where all are together, some operators have a large stockpile of work, others go hungry.

More than one product can run on the same line by using four or six tiers, depending on the size of items. The only limit is how high you want the operators to reach. Top tray operators may have to stand to reach their trays.

Mechanics—The six conveyors now in use at Eastman total over 2800 feet of track. Most of the conveyors are powered by two ¾-hp motors. However, this is determined by bulk, and some smaller lines use only one motor. Carriers are spaced on 24-inch centers on four lines and on 18-inch centers on the fifth. On each carrier are four trays, made of lightweight aluminum or fiber. Overhead chain moves carriers at an average rate of 25 fpm.

Employees can work on either side of the conveyor. One system, 475 feet long including transportation to the stockrooms, serves 135 assembly workers.

Working Principle—A typical conveyor in camera assembly follows a simple working principle. Trays of parts are loaded in the stockroom, with a standard load holding at least enough parts for 4 hours' work. Conveyor moves parts from the stockroom to worker at the bench. A worker removes the tray, not just the parts. Identification of parts is by simple letter-number designations on the carriers.

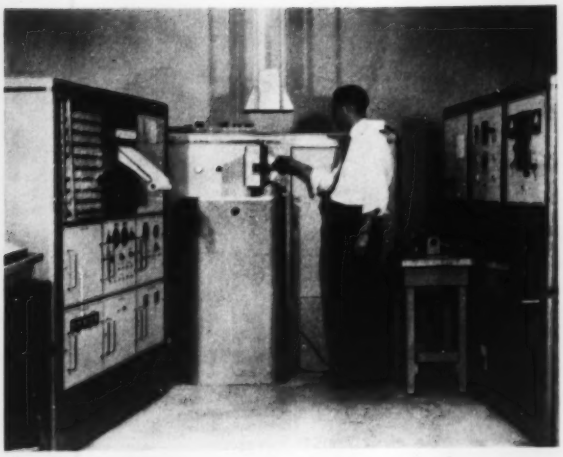
When the operator has finished a tray, the empty is placed on the conveyor upside down, to be replaced in stock vault by a loaded tray. As they work through one tray of parts, they withdraw another to hold in reserve, so they are never out of work.

When their specific job is finished, they move to previously designated alternate jobs, assigned by the foreman. Supply of parts on the conveyor permits the worker to be away from the line without disrupting the work of subsequent operations. The continuing flow of materials to and away from their workplace permits them to set their own pace.

Doubling Up—Kodak produces more than one line of cameras on the same conveyor system. This may be done simultaneously, or the conveyor can be unloaded overnight and the second camera assembled the following day. When a camera model becomes obsolete, there is no shutdown for changeover.

In addition to its other advantages, this system offers a safety factor. Shear pins shut off the conveyors whenever an operator fails to remove or replace a tray properly. There are also manual shutoff switches at various points in the assembly and stock areas. In the seven years of carrousel operation, there hasn't been a single accident.

Spectroscopy for Copper Alloys



Production control Quantometer, product of Applied Research Laboratories, Glendale, Calif., consists of source development, right; spectrometer, rear; console, left

In composition control, these direct-reading devices cope with variation of impure elements as low as 0.001 per cent or alloying constituents as high as 43 per cent

By A. W. YOUNG
Spectrochemical Division
Bridgeport Brass Co.
Bridgeport, Conn.

DIRECT-READING spectrometry, an analysis technique started in the aluminum and magnesium alloy industry and adopted by steelmakers, is proving valuable to copper alloy producers.

Today at least six of the larger producers have installed these automatic, electronic devices to determine alloy composition. In a matter of minutes they must cope with possible concentration variation of 14 or more elements occurring as impurities as low as 0.001 per cent or alloying constituents as high as 43 per cent in the casting control of furnaces producing billets and slabs.

Operating 24 hours a day in an air conditioned, temperature-humidity controlled laboratory at Bridgeport Brass Co., Bridgeport, Conn.,, a production control Quantometer is now being used for analysis of 95 to 100 per cent of all castings produced from induction, arc and continuous casting furnaces. The same coverage by other methods, but with less service, would cost the laboratory an estimated $10,000 more per year, estimates the company's chief spectrographer.

Assure Conformity — Utilizing the spectrometer to assure conformity with specified composition, the company has been able to turn other lab facilities toward special forms of testing, such as mill control problems, research and sales metallurgical testing service.

With this equipment the company reports it is able to make about 69 determinations per man hour, as against 55 with photographic methods, and about eight with wet methods. Accuracy of the instrument is said to be comparable to—in some cases better than—routine analytical wet testing of the same elements, and equal to or better than photographic techniques.

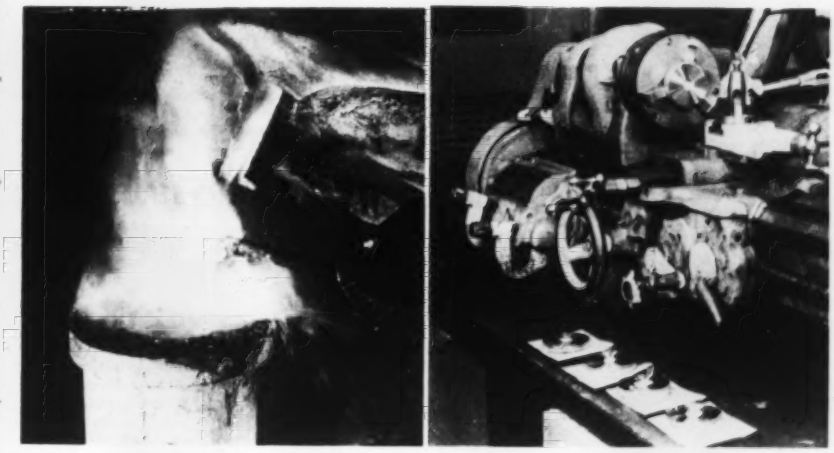
Operations Sketch—The quantometer operates this way: A sample is faced to obtain a smooth surface, free from tool mark. Placed on the spectrometer platform, it is subjected to an electrical discharge.

Resulting gaseous vapor of the melted metal has a luminosity which is broken up by a grating into wave lengths of light. When these rays strike photomultiplier tubes (arranged to receive light corresponding to the elements desired in the analysis), the tubes develop voltage which changes capacitors for each element. Ratios of energies developed between the charges on the element capacitors and that developed from the matrix element tube and capacitor (copper in this case) are registered on a strip chart recorder to be converted into terms of calibrated concentrations by a calculating device.

Four-Minute Analysis — During peak operations Bridgeport runs 26,000 determinations a week on this instrument without reaching its maximum capacity. This represents 10 elements per sample. Time from entering lab to reporting results on ten elements is less than four minutes. A pneumatic tube system conveys samples from furnace platform to lab.

Previously, complete wet analysis required from two to four hours. And on silicon aluminum alloys, analytical time might take as long as eight hours.

By photographic techniques, about 30 samples grouped on a plate were run in two hours; reports covered about eight elements per sample in the range 0.0001 to 1.0 per cent. If necessary, individual samples could be run off spectrographically in ten minutes. While photographic



A sample of the molten brass is removed for chemical analysis during pouring into the billet mold. Samples are faced in order to obtain a smooth tool-mark-free surface. Finished samples are seen on the bench

TABLE NO. 1

Some typical ranges of composition in copper base alloys covered to date on the Quantometer by Bridgeport Brass.

ALLOY	RANGE OF COMPOSITION
Copper	from 57% to 98% by difference
Zinc	from 0.001 to 42.0%
Lead	from 0.001 to 3.5%
Tin	from 0.001 to 8.5%
Iron	from 0.001 to 2.0%
Nickel	*from 0.001 to 12.0%
Silicon	from 0.001 to 4.0%
Aluminum	from 0.001 to 10.0%
Cadmium	from 0.001 to 0.5%
Manganese	from 0.001 to 2.0%
Arsenic	from 0.001 to 0.5%
Phosphorus	from 0.07 to 0.3%

Silver, Bismuth, Antimony, in impurity range of 0.001 to 0.3 per cent.

*At present. Company expects to get up to 30 per cent—a major portion of work is now being conducted on high nickel alloys.

technique involves development of plate and interpretation of data requiring additional handling time, the spectrometer avoids all this and, in addition, records the results.

Off-Mixture Correction—After testing, lab technicians relay off-mixture analysis information to the casting department. Samples are taken from the molten stream from the furnaces during pouring. Rapid analysis permits corrections to be made on the next round if off mixture occurs. When operating men suspect something wrong, they can take a dip sample from the furnace and have it analyzed to make possible corrections on the mixture while it is still in the furnace. Chill cast samples are obtained using laboratory-designed molds to reduce effects of segregation and element diffusion on accuracy of analyses.

Laboratory is now set up to do analysis of all but phosphorus, bismuth, antimony and low arsenic, with one discharge condition, as technicians have found they can get needed sensitivity plus accuracy. The above elements can be handled, but require a slight change in discharge type. Setup is oscillating discharge type with an inductance of 360 microhenries, a capacitance of 10 microfarads, and a resistance of 3 ohms using 1000. With this arrangement, a wide range of elements can be tested with minimum equipment and adjustment. Samples are tested as they arrive without regard to alloy group.

Calibration Adjustment—Aluminum industry technicians generally run standard samples and adjust the calibration of equipment every hour to assure optimum performance. Much the same procedure is followed by steel companies. On copper base alloys at Bridgeport, complete calibration is necessary only once a day. Corrections for variations in performance are made by running standard samples and adjusting scales on the calculator every eight hours. Thus, time of handling is reduced appreciably.

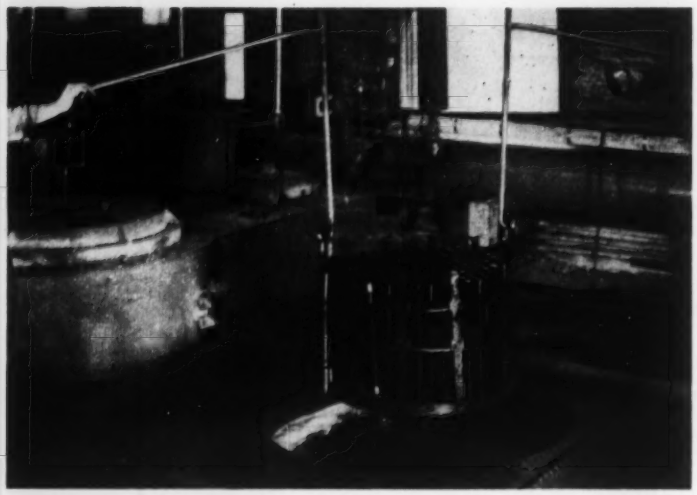
A Dunn-Lowry drum type calculator has been adopted by Bridgeport Brass technicians to provide a definite position on the calculator for each alloy group. Within that alloy group all element scales for all ranges determined are placed in sequence of order obtained from the chart. The calculator drum contains concentration scales for each element and concentration range. Chart readings are set on the strip at the base of the drum, proper element scale selected and reading made. Unit allows the technicians to transform readily to percentage values the chart readings of a wide range of elements, mixtures and concentrations.

Printed charts such as are used in the aluminum and steel industries are not used extensively due to the extreme range of variation of the elements determined and the large number of possible alloy groups. For this reason the calculator device has proved a simple and efficient means of reducing the over-all time of testing.

TABLE NO. 2

Spectrometer Performance Characteristics (from tests conducted at Bridgeport Brass using one source condition)

	Concentration	Standard Deviation	Per Cent Standard Deviation
Zn	0.053	0.0014	2.64
	10.00	0.09	0.83
	15.00	0.13	0.87
	18.00	0.09	0.50
	30.00	0.14	0.46
	35.00	0.16	0.46
	38.00	0.15	0.39
Pb	0.06	0.0016	2.7
	0.5	0.011	0.22
	1.62	0.010	0.62
	1.88	0.024	1.29
	3.42	0.038	1.11
Sn	0.038	0.055	4.5
	0.16	0.004	2.5
	0.62	0.008	1.30
	1.25	0.018	1.44
	2.00	0.043	2.14
	4.78	0.050	1.04
Fe	0.029	0.0026	9.0
	0.14	0.004	2.85
	0.72	0.021	2.90
	0.97	0.016	0.64
Ni	0.058	0.002	3.4
	0.95	0.013	1.4
	10.00	0.123	1.4
Si	0.015	0.0003	2.0
	0.136	0.0014	1.06
	0.47	0.0055	1.17
	2.00	0.035	1.75
	3.17	0.034	1.07
Al	0.03	0.0006	2.0
	2.17	0.032	1.47
	3.00	0.041	1.37
	5.60	0.039	0.76
	7.15	0.053	0.74
Cd	0.033	0.0027	8.2
Mn	0.26	0.0044	1.69
	0.37	0.0068	1.8
	1.27	0.034	2.7



Here a fixture of densely-packed torsion bars is being withdrawn from a distributor-type quenching tank

Number 3 in STEEL's

MODERN HEAT TREATING SERIES

By ALEXANDER J. JAREMA
Sales and Development Engineer
Lindberg Engineering Co.
Chicago

FUNDAMENTALS OF QUENCHING — PART 2

Design For

Loads, furnace cycles and the way furnaces are operated have a significant bearing upon the sizing of auxiliary storage tanks and quench medium cooling devices

DUE CARE in the layout of batch quenching systems pays off in precise metallurgical control. After such items as quench tank, agitating pump and auxiliary storage tank have been sized (STEEL, June 7, p. 110), a cooling device should be selected.

Depending upon the quench medium and the availability and cost of plant water, the cooling device may take any one of a number of forms (See box p. 116).

Regardless of type, it should be emphasized that the device should be under automatic temperature control. It should be precise enough to maintain reasonably accurate quench medium temperature—once the heat shock from a quench has been extracted from the system.

Rule—It should be noted that proper sizing of the quench medium cooling device is a function only of the amount of heat to be removed from the system between quenches; it does not in any way depend on the volume of quench fluid in the system.

To accurately size the cooling device, careful consideration must be given to furnace heat cycles, number of furnace units to be served by the quench installation, furnace working hours per day, etc. To show the effect of these factors, let's take a few examples.

One Shift—First, assume that the quench system is to take care of only one heat treating furnace, operating one 8-hour shift. Total time of the charge in the furnace is estimated at about 6 hours.

Under these conditions, it is possible to obtain only one heat per day from the furnace; and the only time it can be quenched is near the end of each work day. The quench medium cooling device will have 24 hours to recover quench medium temperature (drop it from 150° F to 120° F), and the cooler must be capable of removing 360,000 Btu in 24 hours or about 15,000 Btu per hour.

Two Shifts—Now, say the furnace is to be used for two, 8-hour shifts per day. One heat would be removed from the furnace and

SAMPLE PROBLEM FOR OIL QUENCH

KNOWN AND ESTIMATED DATA:

Number of furnaces to be served by quench system	1
Maximum quench fixture size	28″ Dia. x 36″ Deep
Estimated quench fixture weight	500 lbs.
Estimated maximum load in fixture	1000 lbs.
Estimated typical heat treating cycle	6 hrs.
Furnace use cycle	One, 8-hr. shift/day
Estimated quenching temperature	1600° F
Oil temperature at start of quench	120° F
Allowable oil temperature at end of quench	150° F
Typical maximum work section thickness or dia	2″

QUENCH TANK SIZE

Calculations:

Maximum quench fixture size	28″ Dia. x 36″ Deep
Estimated nominal quench tank size to provide clearance	36″ Dia. x 48″ Deep
Actual inner quench tank volume	$0.785(3)^2$ x 4 or 28.3 cu. ft.
One gallon equals	231 cu. in. or 0.134 cu. ft.
Actual inner quench tank volume	28.3 divided by 0.134 or 211 gallons

Allowing for scale removal basket space at bottom of quench tank, total volume estimated at 250 gallons.

AGITATING PUMP CAPACITY

Check No. 1:

(Based on required work cooling rate)

Typical maximum piece section thickness or dia.	2″
Maximum allowable cooling time at 1″ thickness or diameter per minute	2 Min.
Maximum gross load (work and fixture)	1500 lbs.
Heat content at 1600° F quenching temperature	240 Btu/lb.
Total heat energy in load	1500 x 240 or 360,000 Btu
Actual required cooling rate	360,000 Btu in 2 minutes or 180,000 Btu per minute
Btu picked up by each gallon of oil at 30° F temperature rise	113
Agitation rate required	180,000 divided by 113 or 1600 gpm

Check No. 2:

(Based on achieving turbulence in quench tank)

Quench tank volume	250 gallons
Circulation rate to produce turbulence	2 to 3 changes/min.
Gpm to produce turbulence	500 to 750 gpm

Check No. 1 gives the greater agitation rate. Therefore, agitating pump capacity must be at least 1600 gpm.

STORAGE TANK SIZE

Total heat energy to be absorbed per load quenched	360,000 Btu.
Assumed allowable oil temperature rise in system	30° F
Btu in each gallon of oil for 30°F temp. rise	113
Total gallons required in system	360,000 divided by 113 or 3200 gallons
Volume of quench tank	250 gals.
Required storage tank capacity	3200 minus 250 or 2950 gals.

OIL COOLING DEVICE

Availability of plant water	restricted
Type of cooler indicated	evaporative
Loads received from furnace	1 every 24 hours
Heat content per load	360,000 Btu
Rate of heat removal required	360,000 divided by 24 hours or 15,000 Btu/hr.

Therefore, an evaporative cooler of 15,000 Btu/hr. minimum capacity must be specified. Manufacturer will also have to be advised of geographical location to obtain maximum wet bulb temperature through year and manner of installation (indoors or outdoors) to decide whether anti-freezing provisions are necessary.

Batch Treatment Systems

quenched near the end of each 8-hour shift. Quench tank size, agitating pump capacity and storage tank capacity are the same as in the previous example. But the quench medium cooling device has only 8 hours to drop the quench medium temperature the required 30° F.

Cooling device will have to be rated at 360,000 Btu in 8 hours or 45,000 Btu per hour. These examples make it apparent that the way the furnace is operated has a tremendous influence on sizing of the quench medium cooling device.

Two Furnaces—In a more complicated case, the quench installation may serve two identical furnaces, each capable of delivering a 1500-pound gross batch every 6 hours. The furnaces might be used only one 8-hour shift per day.

Furnace loads will reach quenching temperature and soak out at about the same time, and the two charges will be quenched closely together. This amounts to practically the same thing as quenching out a single 3000-pound gross load as far as flywheel effect is concerned.

Here, the total volume of quench medium in the system will have to be twice as great as in the one-furnace setup, and the auxiliary storage tank capacity is almost doubled. Since the two furnaces would be used only during one, 8-hour shift per day, the quench medium cooling device would have to extract 720,000 Btu in 24 hours or about 30,000 Btu per hour.

Factors—From the examples, it can be seen that loads, furnace cycles and the way furnaces are operated have a significant bearing on the sizing of the auxiliary storage tank and quench medium cooling device. It would be risky to specify a batch quenching system without first having at least an approximate knowledge of these factors.

Water—In areas with adequate and low-cost plant water supply, water quench systems may be satisfactorily cooled by continu-

SELECTION OF QUENCH MEDIUM COOLING DEVICES

WATER PLENTIFUL AREAS

Quench Medium	Method of Cooling
Brine	Water coils or radiators directly in quench tank or storage tank or external shell-and-tube heat exchanger.
Water	Governed supply and overflow of plant water from quench system.
Oil	Water coils or radiators directly in quench tank or storage tank or external shell-and-tube heat exchanger.

WATER SCARCE AREAS

Quench Medium	Method of Cooling
Brine	Evaporative-type heat exchanger equipment.
Water	Spray cooling tower.
Oil	Evaporative-type heat exchanger equipment.

ously overflowing plant water from the quench system to the plant drain. The incoming water supply line should be equipped with a proportioning control valve, such as the Powers. These valves are generally of the straight mechanical type, involving a liquid-filled system with a temperature sensing bulb in the quench tank, a capillary connecting tube and a bellows or a diaphragm-operated valve.

The maximum water flow may be estimated with reasonable accuracy by assuming a water inlet temperature of about 70° F and an outlet temperature of about 90° F. Each pound of water overflowing from the system will carry out about 20 Btu or about 165 Btu for each gallon.

Others — In water - plentiful areas, brine and oil quench systems can be cooled with water coils or radiators directly in the quench tank or storage tank.

Water coils might be made from standard pipe. Calculations of required coil length are difficult; however, one can use the rule-of-thumb figure of 0.21 feet of 2-inch pipe or 0.38 feet of 1-inch pipe per pound of steel quenched per hour. For larger installations, specially-engineered radiators are preferred because of greater efficiency. They are manufactured by such firms as the Trane Co., LaCrosse, Wis. Manufacturers are able to recommend suitable sizes.

For the largest installations, external, self-contained shell-and-tube heat exchangers are generally employed. These have standard ratings in Btu per hour, and may be purchased as package units from concerns such as Bell and Gossett Co., Morton Grove, Ill.

Less Water — In water-scarce areas, more careful consideration must be given to the quench medium cooling equipment. A few simple assumptions will illustrate the reasoning. In direct overflow cooling of water quench systems and shell-and-tube heat exchanger cooling of oil and brine systems, the plant water can be assumed to pick up only about 20 Btu per pound of water consumed. This is based on a 20° F temperature rise in passing through the system or cooler.

With evaporative-type coolers, (they rely on the latent heat of vaporization of plant water to do the cooling), heat extraction is about 1000 Btu per pound of plant water consumed. So this equipment is about 50 times more economical in water consumption than direct overflowing or shell-and-tube heat exchanger equipment.

Description — The evaporative-type cooling device is a sheet steel enclosure housing a tube bundle that carries the oil or brine to be cooled. The unit incorporates a separate water pump and overhead system of headers and nozzles to direct a finely divided spray of water over the tube bundle containing the quench medium. It also has a centrifugal blower to pull outside air through the unit to increase rate of evaporation of the water.

The only plant water consumed is that required for makeup due to evaporation. These coolers are made in standard sizes by the Trane Co. and the Niagara Blower Co., New York City, with specific ratings in Btu per hour.

In specifying this type, it is necessary to give the manufacturer supplemental information, such as geographical location of installation and whether the cooler will be installed indoors or outdoors.

Location enables the manufacturer to determine maximum wet bulb temperature throughout the year, etc. The engineer charged with responsibility for specifying the quench system should also obtain information on the required flow through the tube bundle in gpm. This allows selection of the correct size of external quench medium circulating pump.

Where plant water must be conserved, water quench systems may be advantageously cooled by using water spray cooling towers, such as those of the Binks Mfg. Co., Chicago. When a spray cooling tower is used, a centrifugal circulating pump of small capacity is required. It pumps water out of the storage tank into the spray tower. Water return is by gravity.

This is the second part of a two-part article on the subject by Mr. Jarema. First appeared in last week's issue of STEEL.

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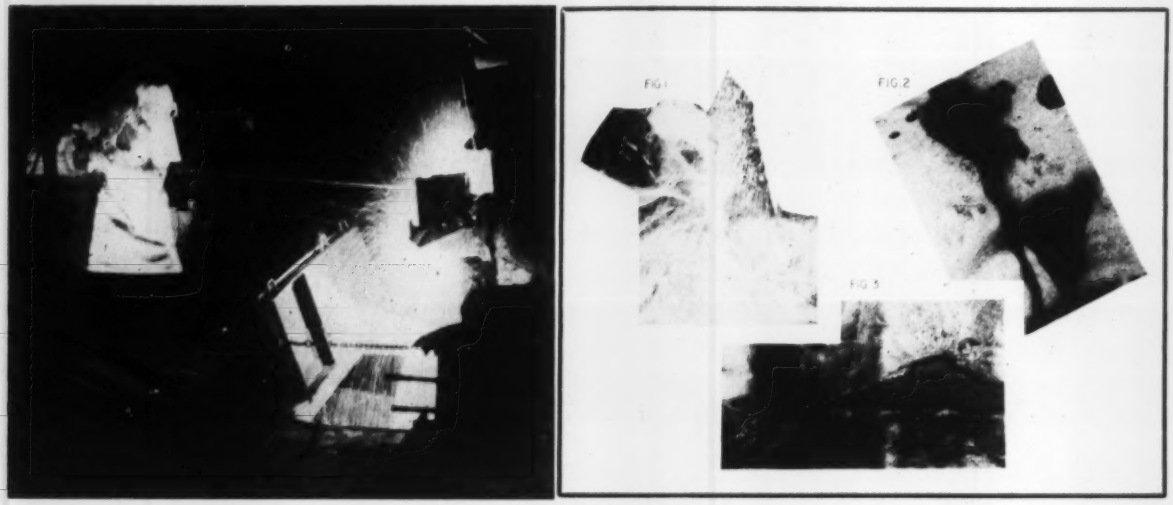

Wearing aluminized garments, helper can slag-off electric furnace without relief period. When hot metal was poured on cloth, right, some charring took place on the inside (Fig. 2), but metal did not break surface (Fig. 3)

ALUMINIZED SAFETY CLOTHING Keeps Cool In The Hot Jobs

By taking advantage of new process for bonding metallic aluminum to light asbestos cloth, highly reflective and spatter-shedding garments have evolved. Here's test proof

ASK any safety engineer what the hardest part of his job is, and he'll tell you. . . "Getting the men to *want* to wear the equipment!" Which makes even more interesting the news that workers in the hot jobs in steel plants and foundries have happily accepted protective equipment made from aluminized cloth.

Created by Minnesota Mining and Mfg. Co., the material has been undergoing use tests for the last two years in selected applications. Results have been so encouraging that production of the treated cloth has been stepped up to meet the demands of safety equipment makers and distributors.

How It Started—The 3M company was not alone in its interest in using aluminum's heat reflective qualities for personnel protection. For instance, even before receiving some of the first samples in late 1951, Frank Corrigan, safety engineer at Carpenter Steel Co., Reading, Pa., had tried spraying aluminum paint first on cotton duck and canvas, then tried aluminized fiberglass-asbestos cloth. It reflected heat fairly well when new, but heat and wear quickly broke down the structure and nullified much of the reflectivity.

In the meantime, 3M was perfecting a vacuum process which actually plated a comparatively tough, resilient coating of aluminum to the cloth. "We got our first samples of aluminized cloth just about the time we were talking to ourselves," recalls Corrigan. "We took them to a local shoemaker and had him make up two aprons and two ponchos which we gave to the men in the melting department. They became sold on them immediately."

Reason Why—It's not hard to understand why. Garments weigh less than half as much as the asbestos ones they replaced; and instead of heating up and retaining that heat, the aluminized cloth reflects all but a small fraction of the heat and retains that for only an instant. Another plus: The absence of thick, bulky clothing gives workers much greater freedom of

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Contrast between old and new protective clothing worn by ingot yard men at Lukens is evident. Photo, right, shows items in daily use at Carpenter Steel

action in performing their jobs.

Carpenter uses aluminized clothing in the form of aprons, ponchos, leggings, spats, coats, bibs, sleeves, boots, chaps and parkas. Melters on the electric furnaces formerly had to relieve each other during slagging-off, heat becoming too severe after about 2 to 3 minutes. Now, one man can work in front of the open door for the full period of time (usually about 10 minutes).

The Record — Formerly there were about 20 reported cases of body burns, either through metal splash or radiant heat, every year. Naturally, most of these occurred when men had not been wearing the equipment at their disposal. But now burn cases have been cut to zero.

There's a positive side to consider too. With better heat protection and ease of action, Carpenter finds it can perform many of the furnace repair and maintenance jobs without completely shutting down the equipment. For instance, wearing face shields, aprons and spats, maintenance men have changed doors on ingot reheating furnaces that were operating at 2100° F.

Lukens Too—Another of the pioneer companies in this regard is Lukens Steel Co. at Coatesville, Pa. Here again, acceptance of the new safety material has been widespread and enthusiastic by the men called upon to wear it. Safety engineer, Frank Bird, reports that workers take the assignment of hot work with more receptive attitudes because of the additional comfort afforded them by the aluminized apparel.

"Unlike the old asbestos aprons and coats, which were heavy to begin with, the aluminized articles do not gain weight with use. Molten spatter rolls right off instead of sticking to the fabric as it does with the asbestos," Bird points out.

Spatter figures in quite heavily at Lukens, since most of their application experience with aluminized clothing centers in the ingot and slab conditioning yards. In the former, men with oxygen lances burn off irregularities on the ingots that have just come from the stripping area. Sizeable savings in soaking pit time have been recorded as a result.

Broader Use — An interesting sidelight at Lukens is the fact that many workers other than those in the test jobs, after the word got around, came to the safety department with suggestions for broader use of the aluminized garments. Train crews hauling the hot ingots from the stripping area now have aluminized coats hanging in the locomotive cabs, useful whenever a derailment occurs and cars must be jacked back onto the track. Men can work in close proximity to the hot ingots.

Further application is found in the open hearth floor where ladlemen wear aluminized coats with parka hoods. Splashes used to burn through the older hot coats inflicting disabling injury, but not any more. Similar coats are worn by workers on the hot spinning machines that produce exceptionally large heads for pressure vessels.

Cost vs. Wear—First cost of the aluminized articles is greater than the outlay for heavy asbestos garments. However, the longer-wearing qualities of the aluminized cloth more than offset the higher first cost. In ingot conditioning, Lukens has recorded coat life up to the equivalent of 85 heats totalling 1447 ingots. Practical life of aprons, used with sleeve gauntlets by the slab conditioners, varies from four to six weeks; while the old asbestos apron varied from three to four weeks in life.

Carpenter Steel reports considerably longer life for the ponchos and bibs used by the melters, but this can be attributed to the different wear conditions of the respective applications. Carpenter also does spot repair work on their aluminized garments, using aluminum paint spray bombs to seal over small cracks or breaks that develop as the aluminum coating begins to wear.

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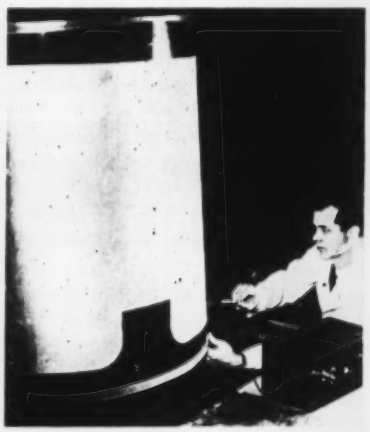

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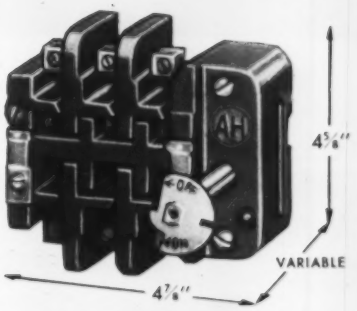

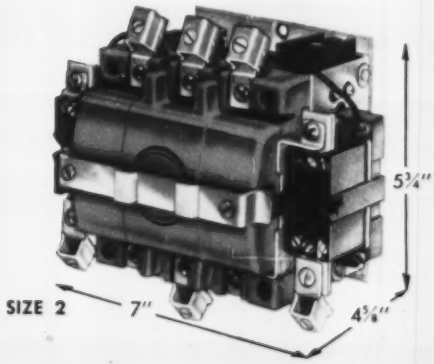

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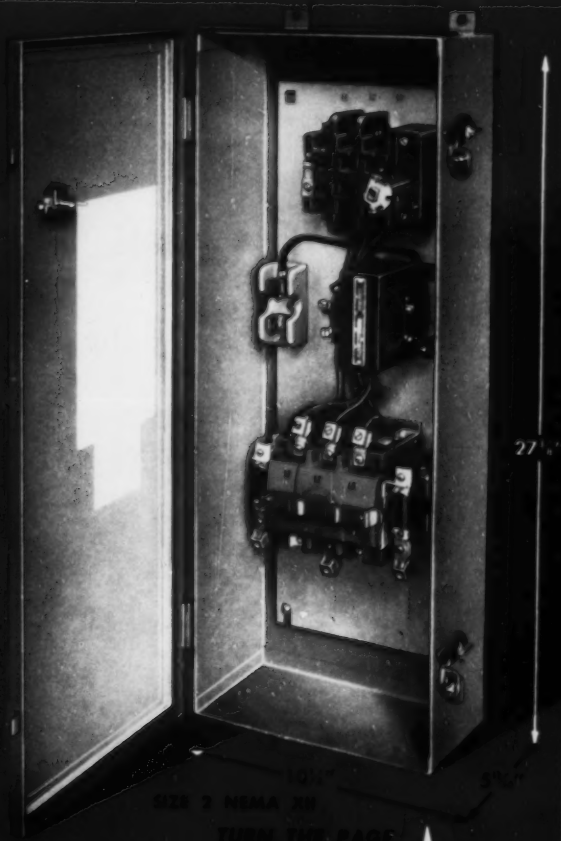

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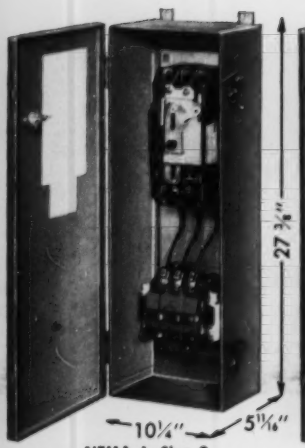

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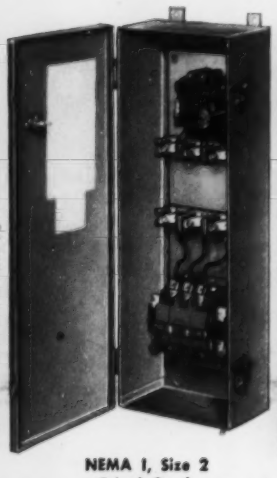

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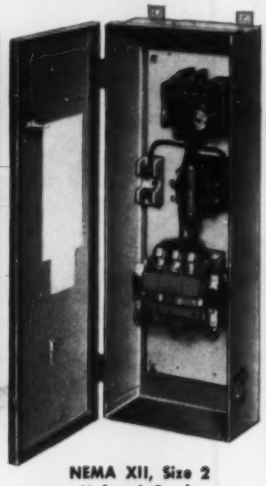

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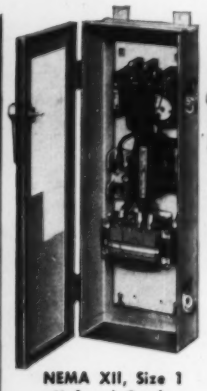

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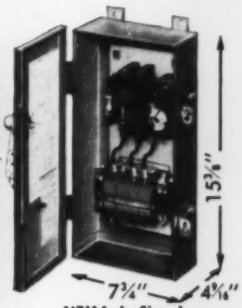

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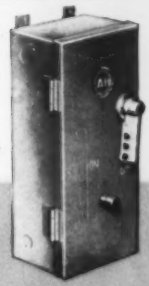

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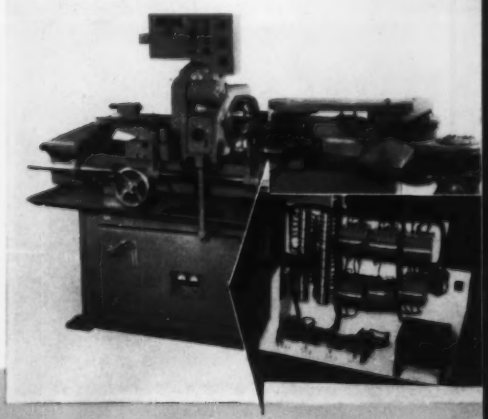

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THE ARROW-HART & HEGEMAN ELECTRIC COMPANY
103 Hawthorn Street, Hartford 6, Conn.

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ARROW·HART
INDUSTRIAL CONTROL DIVISION

Tin Developments

CONTINUING WORK on the development of tin alloys, both in the U. S. and abroad, indicates considerable promise for the extension of the products' applications. An example is the development of a new electroplating alloy containing 75 per cent tin and 25 per cent zinc.

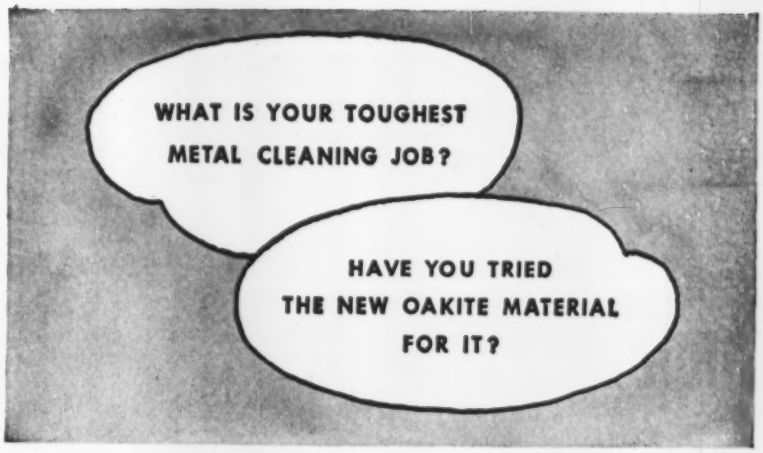
Finding wide use in Great Britain and continental Europe, it, in addition to providing superior corrosion resistance for steel, lends itself to soldering. Steel coated with the alloy is being assembled with aluminum parts without any ensuing electrolytic deterioration; as steel nuts holding aluminum shapes.

Alloy in Use — Steel parts of most British airplanes now are plated with the alloy. Among other successful applications of the new alloy are coatings on cooling units for refrigerators, steel parts of automobile brakes and parts of radio and TV chassis.

Dr. E. S. Hedges, director of research, Tin Research Institute, reports success with a new coating for brass which consists of two parts tin and one part nickel. Highly resistant to tarnishing and having an attractive appearance, faint rose in color, it lasts well on brass and gives good service on steel when deposited on a copper strike.

Alloy Experimentation—Several other alloys are in the experimental stage. One of them is a white alloy containing 15 per cent manganese, 8 per cent tin and the remainder copper. Rolled into sheet, it is intended as an alternate to nickel-silver. Another is a cupro-nickel in which the nickel content is reduced from 25 to 15 per cent by adding more copper. Properties of the conventional alloy remain substantially the same following this substitution.

Another development in the experimental stage involves a new class of bearing metals containing 20 to 30 per cent tin and the remainder aluminum. To obtain hard metal for heavy-duty service, 3 per cent copper is added as the hardening agent. These bearings are being tried out in English motor trucks.

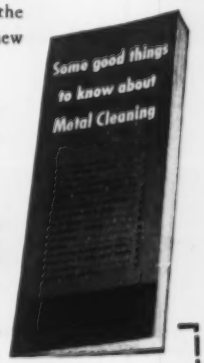


During the past year, the Oakite Chemical Research Laboratory has produced 16 new materials for performing the following metal cleaning and processing operations:

1 Heavy-duty cleaning in tanks
2 Etch-cleaning aluminum
3 Washing in pressure-spray machines
4 Electrocleaning zinc-base die castings
5 Putting heavy zinc phosphate coatings on steel in preparation for painting
6 One-operation cleaning, pickling and conditioning for painting
7 Stripping paint
8 "Killing" paint in spray booth wash water
9 Drawing and forming

One of these new materials may be the right answer for some problem that's been giving you a lot of trouble. Just circle the job number in the coupon, and let us tell you about the new chemical designed for the work.

FREE Our 44-page illustrated booklet "*Some good things to know about Metal Cleaning*" has been revised to discuss the application of the 16 new materials.



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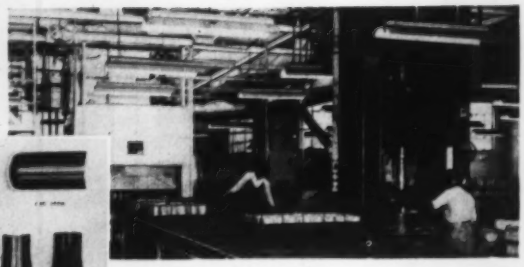
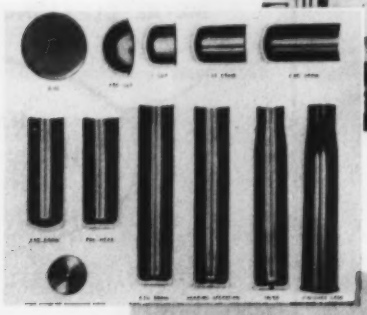
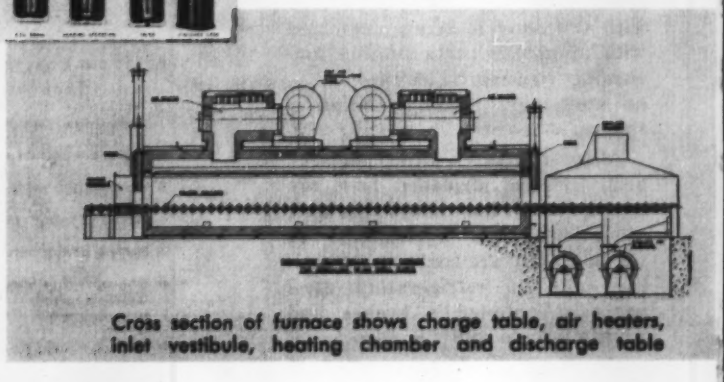


View of the charge end of the furnace shows first and second anneals being carried out at the same time



Steps in production of a 90-mm steel cartridge case



Cross section of furnace shows charge table, air heaters, inlet vestibule, heating chamber and discharge table

Anneal Furnace Makes Double Play

Brass or steel cartridge cases are successfully annealed with only a slight variation in furnace cycle. They're using direct, convection heated roller hearth furnaces

By W. M. HEPBURN
Vice President in Charge of Engineering
Surface Combustion Corp.
Toledo, O.

DESPITE differing metallurgical and heat treat characteristics of steel and brass, both can be annealed with excellent results in direct gas-fired furnaces.

Case in Point—Wilson Foundry Division of Willys Motors, Inc., Pontiac, Mich., has been producing 90-mm steel cartridge cases and annealing them in Surface Combustion roller hearth convection furnaces. A 1250° F temperature anneal is required after each press draw to relieve the work stresses set up during the cold drawing operations.

When a changeover to brass was required, the same furnaces were utilized in carrying out a 1050° F anneal after each press draw. Switchover was accomplished with relative ease.

Restoration — Since automatic proportioning direct-fired tunnel burners were used, in the air heaters, it was a simple matter to adjust the burners for the reducing atmosphere which is ideal in processing the zinc-bearing brasses. Although a slight oxide film forms on both brass and steel cases, it is easily removed in the subsequent cleaning and lubricating operations.

To accomplish deep case drawing operations for cartridge case production, it is important that anneals be accurately controlled. This is necessary to provide uniform hardness throughout the material and to produce a grain structure suitable for cold working. In essence, the metal must be restored to its original yield point before additional redrawing.

Uniform Heat—To achieve the greatest possible degree of heating uniformity, within the operating range required (1050 to 1250° F) convection heating was provided in two Surface Combustion roller hearth furnaces.

Cartridge cases are exposed to heated products of controlled combustion from direct gas-fired air heaters as the trays move through the heating chamber. Temperature of these heated gases is automatically controlled at the heater.

Overheating of any portion of a shell is impossible since the work can only get as hot as these rapidly moving gases, and continuous exposure to these gases will result in a uniform temperature through the cross section of each case. Average time in the heating chamber is about 1.3 hours.

Cooling — Each furnace is equipped with a charge table, inlet vestibule, insulated heating chamber, and a discharge table that is equipped with an air plenum chamber and cooling nozzles, located below the roller. Two 14,000

SEQUENCE OF OPERATIONS

STEEL (AISI 1030)	BRASS (70-30)
Process and clean discs	Process and clean discs
Cup	Cup
Anneal—1250°F	Anneal—1050°F
Process for draw	Process for draw
First draw	First draw
Anneal—1250°F	Anneal—1050°F
Process for draw	Process for draw
Second draw	Second draw
Anneal—1250°F	Anneal—1050°F
Process for draw	Process for draw
Nibble trim	Third draw
Third draw	Roll trim
Roll trim	Pre head
Pre head	Anneal—1050°F
Anneal—1250°F	Process for draw
Process for draw	Fourth draw
Fourth draw	Roll trim
Roll trim	Head
Head	Pierce primer hole
Pierce primer hole	Process clean
Process clean	Taper anneal
Harden and taper anneal (simultaneous)	Process and clean
Stress relieve—750°F	Taper
Process and clean	Trim
Taper	Wash
Trim	Size Mouth
Wash	Mouth anneal
Mouth anneal	Wash
Machine head	Machine head
Size mouth	Wash
Wash	Stress relieve—500°F
Process for varnish	Roll stamp and package
Varnish bake	
Roll stamp and package	

VARIATIONS IN 90-MM CASE SIZES FOR EACH ANNEAL

	1ST ANNEAL	2ND ANNEAL	3RD ANNEAL	4TH ANNEAL
Size	5¾" dia. 4½" long	5½" dia. 8" long	5⅛" dia. 11½" long	5" dia. 14½" long
Weight	11½ lbs.	11¼ lbs.	11 lbs.	9¾ lbs.
Cases per Tray	40	45	53	54

cfm fans force air through these nozzles, upward against the hot trays of cases. This cools them to handling temperature.

In winter, the hot air from this cooling chamber is distributed to several points in the plant to assist in heating for worker comfort. During the summer months, gases are vented to the outside.

Separate Systems — Heating chamber, 40 feet long from wall to wall, provides two zones of controlled heat. Each zone has its own recirculating fan mounted as an integral unit on top of the furnace.

Each air heater is equipped with a low pressure, automatic proportioning burner operating on natural gas. The fans recirculate 24,000 cfm of heated air within each zone.

Air heaters and recirculating systems are equipped with safety controls to protect the furnace equipment and to prevent gas, air, or electric current failure. Potentiometer-type strip chart controller recorders automatically regulate the burners by "on-off" control to maintain the proper furnace operating temperature in both zones.

Production—Furnace hearth consists of alloy rollers, on 12-inch centers, each powered by a variable speed chain drive. Average speed is 6115 inches per minute during the four separate stress relief anneals.

Design capacity of each furnace provides for a net production of up to 7560 pounds per hour. This amounts to about 700 90-mm cases per hour, depending on the depth of previous draw and size and weight of the case.

Partners — With two rows of trays accommodated in each furnace, cases from the first and second draws can be simultaneously processed in one furnace while cases from the third and fourth draws are in the other furnace. This arrangement can be alternated between furnaces and between rows as required.

Over-all length of each furnace is about 67 feet, and the over-all width over 16 feet. Charge table is 6 feet long and the discharge table is 16 feet long. Both are power driven.

Quality Control—Materials and the equipment are kept under constant surveillance to insure the highest quality product. This is especially important during annealing, since improper heating will result in non-uniform grain size and an uneven draw.

Two brass discs from each lot, as received, are given a complete chemical analysis and grain size determination. Each lot must be okayed at this stage before material can go into production. Once each day additional grain size checks are run after each precup and annealing operation. One case is also given a tensile test each day and 18 cases from each lot are checked for uniform hardness.

Handling—To achieve the high production rates, the roller hearth annealing furnaces and draw presses are equipped with gravity and power conveyors. This system connects the charge and discharge positions of the furnaces with the loading and unloading racks of the draw presses.

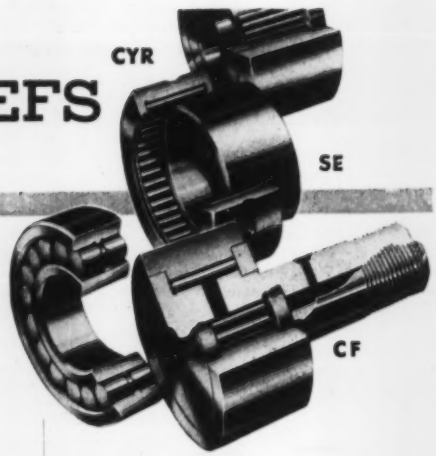
Each draw press performs a push-through operation with work forced through die rings in the bed and ejected under the press. A reverse chute delivers drawn cases to an inspection station on the other side of the press.

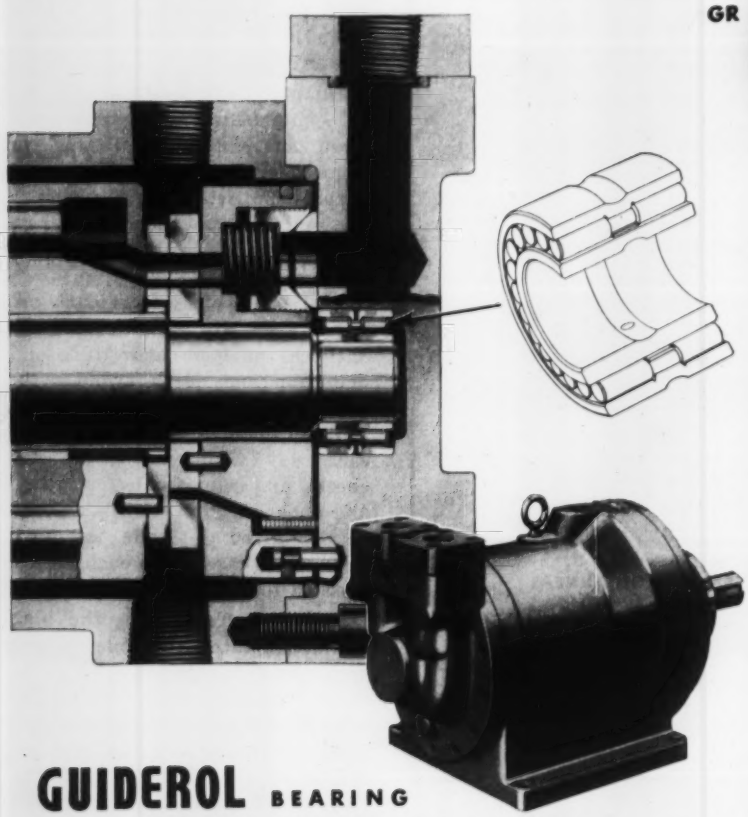
Four Passes — Presses and the discharge end of the furnace are in turn connected to the cleaning line. This completely conveyorized system permits rapid movement of the cases in trays with a minimum of direct handling of even a single case.

Sequence of operations on 90-mm cases requires that each cartridge case make four separate passes through the annealing furnaces. Subsequent operations in the processing of these shells are also completely conveyorized or made completely automatic wherever possible.

(Advertisement)

McGILL BEARING BRIEFS





GUIDEROL BEARING

used in pilot model Oilgear Motor

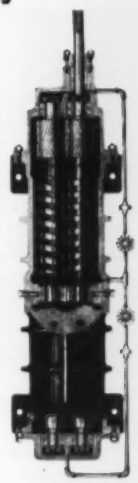
SHOWS NO WEAR AFTER 4000 HOUR TEST

The Oilgear Company, Milwaukee, Wisconsin, a regular McGill bearing user, has been testing a pilot model of a new 60 HP Axial Type Hydraulic Motor equipped with Guiderol Bearings for over a year. After 4000 hours of full load operation, the Guiderol Bearing used on the pilot end of the motor shaft was removed and inspected. It was still in perfect condition showing no internal wear.

This new line of lighter and faster operating axial piston units take advantage of the Guiderol bearing's assured freedom from skewing and extra load capacity in reduced radial bearing space.

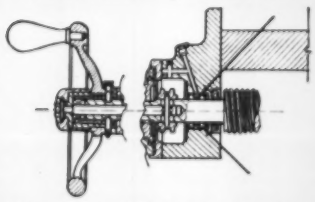
Mr. Ernst Wiedmann, Oilgear Chief Engineer, is enthusiastic about the performance of the Guiderol Bearings. He says: "They are the best full-type roller bearings for our hydraulic pumps and motors." As a result he is changing old specifications for this type of bearing to Guiderol and including Guiderol Bearings on all new developments.

WARREN-QUIMBY ADOPTS GR BEARINGS FOR MAXIMUM RADIAL LOADS



Warren Steam Pump Company has adopted Guiderol Bearings at five points of maximum radial load in this Warren - Quimby Vertical Screw Pump. The Guiderol Bearings have more load carrying capacity in the limited space available and enable vertical mounting of the pump without roller skewing or locking.

KEARNEY & TRECKER FINDS LIFE FACTOR INCREASED IN TABLE FEED APPLICATION



The life factor of the shaft bearing on the table feed screw of Kearney & Trecker Milling Machines has been increased by the simple process of changing to Guiderol Bearings. These bearings increased capacity, performance and bearing life.

BEARING SELECTION GUIDE
A new 140-page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

McGILL® — Precision Bearings
McGILL MANUFACTURING COMPANY, INC.
301 N. Lafayette Street, Valparaiso, Indiana

Porosity Leaks Plugged

A METHOD which prevents leaks and internal corrosion has solved a leaky problem for an aircraft manufacturer.

Efficiency of cabin pressurizing and air cooling equipment depends on complete pressure tightness. This means micro-porosity, present in all cast metals, must be completely and permanently eliminated.

Impregnation—The Stratos Division of Fairchild Engine and Airplane Corp. uses an impregnation

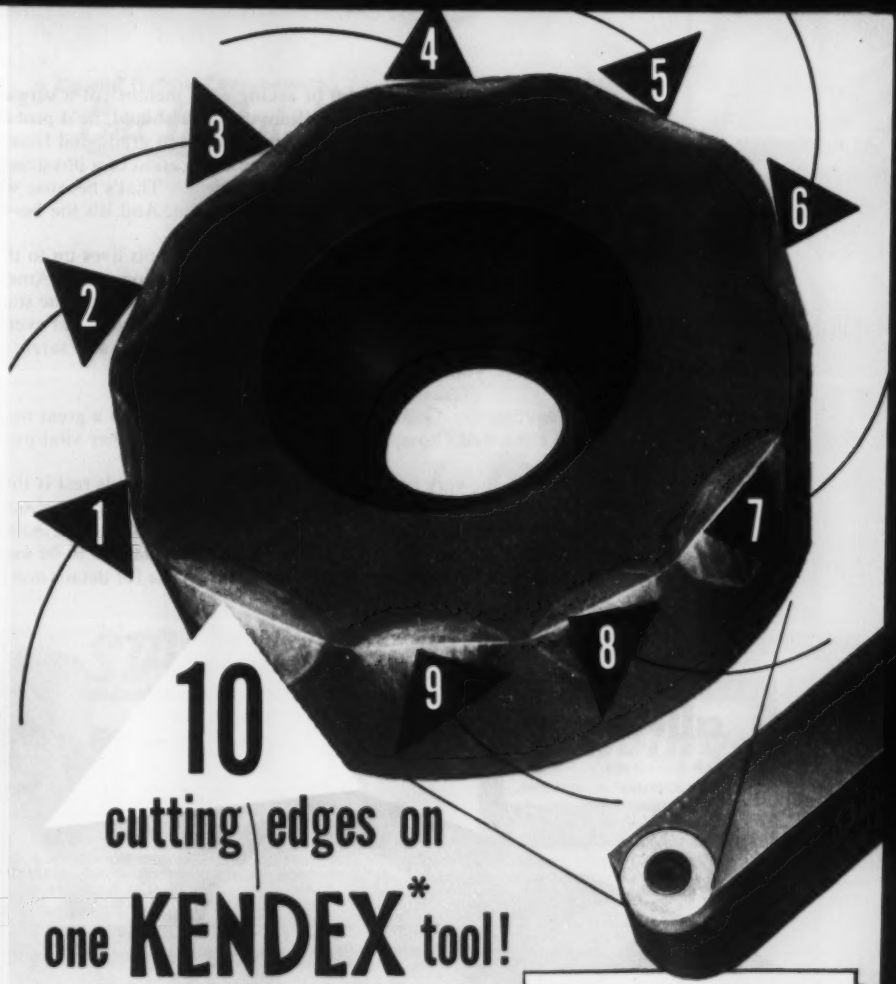
ONE MAN OPERATES UNIT
. . . uses polyester impregnating resin

process developed by American Metaseal Corp. to stop leaks and internal corrosion in sand cast and die cast magnesium and aluminum housings for a variety of aircraft accessories, so that they will hold air pressure without appreciable leakage.

The process uses a batch-type vacuum-pressure method designed for one-man operation. Castings are placed in an autoclave; air is removed from it, and impregnant is introduced. Then compressed air is applied to force it into the evacuated pores.

Pressure is then released, castings removed and cleaned. A curing operation solidifies the liquid impregnant which has been absorbed into the metal structure.

Heart of the Method—A self-contained hub unit comprising autoclaves, high vacuum pump, thermostatically controlled wash tanks, a mechanical surging unit



10 cutting edges on one KENDEX* tool!

No tool grinding expense and *minimum* machine down time for tool changing—these are the advantages you obtain from multiple-edge Kendex "throw-away" insert tools. For example:

A Kendex round insert, used to bore 2½" cast iron stators, machined 300 pieces before one cutting edge dulled. Then, without removing the shank from the boring bar, the "button" was revolved to a new cutting position, until 3,000 stators were machined with the insert's 10 cutting edges. Best previous performance, by a conventional brazed tool, was 400 stators per tool grind.

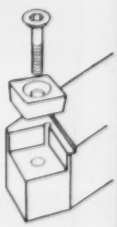
Kendex precision-ground buttons have Kennametal's high wear-resistance, for long life. Screw-mounted, they can be rotated in seconds to new cutting positions without removing or resetting the tool holder . . . a great time-saving feature. When all cutting edges are used, the insert is thrown away—replacement cost is slight compared to that of regrinding.

Only Kennametal makes Kendex "throw-away" inserts. Ask your nearest Kennametal tool representative to help you apply this cost-saving tooling to suitable operations in your plant. Kennametal Inc., Latrobe, Pa.

*Registered Trade-Marks

How KENDEX* Works

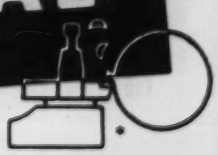
1 Hard, strong, wear-resistant Kennametal is molded into square, round, or triangular Kendex inserts, which are precision ground.



2 Kendex inserts are mounted to suitable tool holders with socket head screws.

3 When edge becomes dull, insert is turned to new cutting position. When all cutting edges have been used, insert is thrown away; no regrinding.

KENNAMETAL*
CEMENTED CARBIDE TOOLING THAT INCREASES PRODUCTIVITY



A-8 SALES OFFICES IN PRINCIPAL CITIES

No one would ever dream of asking each member of a surgical team to name the medical school he attended. If anyone ever should, he'd probably find that no two of these skilled, highly-trained men had been graduated from the same institution. To Americans everywhere, the name or location of a physician's or surgeon's medical school doesn't make the slightest difference. That's because we have only one nation-wide "quality" of medical education. And it's the best in the world.

You see, each of our accredited medical schools lives up to the high principles established by the Council of Medical Education of the American Medical Association, whether it's in Connecticut or California. The standards of medical training are truly national, applying to every school and every doctor. Any threat to those standards is a threat to the future health and safety of your family, your business, your community, your country.

Together the nation's 79 medical schools make up a great national resource—like the Red Cross, the Community Chest and other vital public services.

Today, the very basis on which their high standards rest *is* threatened. Lack of funds menaces the teaching and research programs of all the schools. Thus the problem is national, and can only be solved on a national basis, if an adequate supply of well-trained doctors, surgeons and medical technicians is to be assured. Find out what your firm's stake in medical education is. Write for details and learn how you can help.

all-american team

NATIONAL FUND FOR MEDICAL EDUCATION

FACTS YOU SHOULD KNOW ABOUT MEDICAL EDUCATION

- There are only 79 accredited medical schools in the United States.
- They train 82,000 undergraduates, specialists and technicians and graduate 6,500 doctors annually.
- It costs from $10,000 to $12,000 to train a doctor today.
- Tuition fees, raised 84% over 1940, cover about 20% of cost.
- In the past decade medical teaching budgets have risen 143%; administration and plant operation 150%.
- The medical schools need $10,000,000 annually in additional income to maintain present standards and train the necessary number of doctors required for America's growing population.
- *ALL* 79 medical schools can be aided by a *single* gift to the National Fund for Medical Education.
- Contributions are distributed through annual grants according to a schedule approved by the medical schools.
- The National Fund is a voluntary, non-profit organization approved and supported by the American Medical Association and the Association of American Medical Colleges.

For complete facts on the crisis facing medical education write to

The National Fund for Medical Education,
2 West 46 Street, New York 36, New York

and a power operated press is the heart of the process.

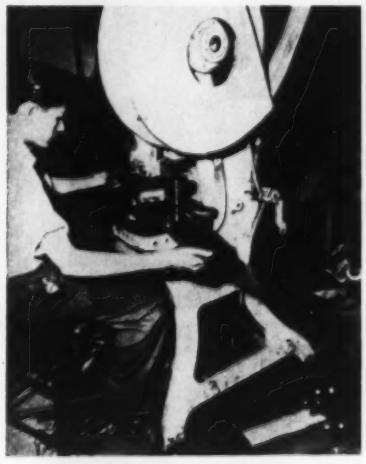
After impregnation, some of the sand castings are machined and anodized; after impregnation, some are painted. Magnesium sand castings are Manodized after impregnation and some are dichromated before impregnation. All aluminum die castings are anodized before impregnation.

Precoated Metal

Profitable finish for fabricators available in variety of colors, widths and thicknesses

PRECOATED METAL is giving at least two companies a chance to take advantage of production, time and money savings.

Kroder Reube Co., for example, previously formed traverse rods from uncoated coil and sheet. After fabrication, the long, unwieldy rods were handled seven times in



COIL STANDS FABRICATION
. . . finish inseparable from base metal

the finishing department: Two cleaning operations, racking, spraying, turning, spraying the other side and unracking.

Precoated Coil — Advantages of Enamelstrip precoated coil, a product of the Enamelstrip Corp., Allentown, Pa., were abatement of a neighborhood paint fume problem, lowered insurance rates and absence of paint lumps which sometimes resulted when rods were sprayed and which prevented rods from sliding smoothly on one an-

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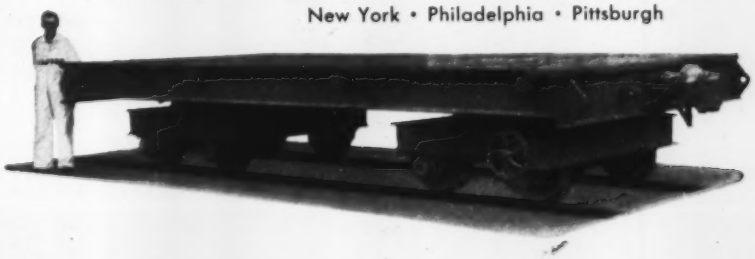
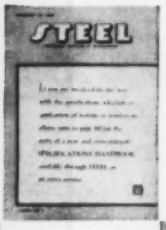


STEEL

STEEL
MORE SCRAP
for more steel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for immediate delivery

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JOHNSON BRONZE COMPANY
550 South Mill Street • New Castle, Pa.

JOHNSON B BEARINGS
Sleeve-Type

Sleeve bearing headquarters since 1901

All Johnson Universal Bronze Bars 13" length.

other. Coil is precoated on both sides with enamel.

Fewer Processes — The Jayem Mfg. Corp., Brooklyn, N. Y., has eliminated cleaning, spraying and baking of fabricated trays, and the slitting of sheets and stacking of strip is no longer necessary.

When they coated trays after painting, globules of paint would sometimes mar the surface, causing rejects. The uniform finish on precoated coils has done away with rejects; and the use of enamel strip has eliminated necessity of expanding the plant's painting facilities. Perhaps most important is the fact that the strip has cut down operations from four to two processes.

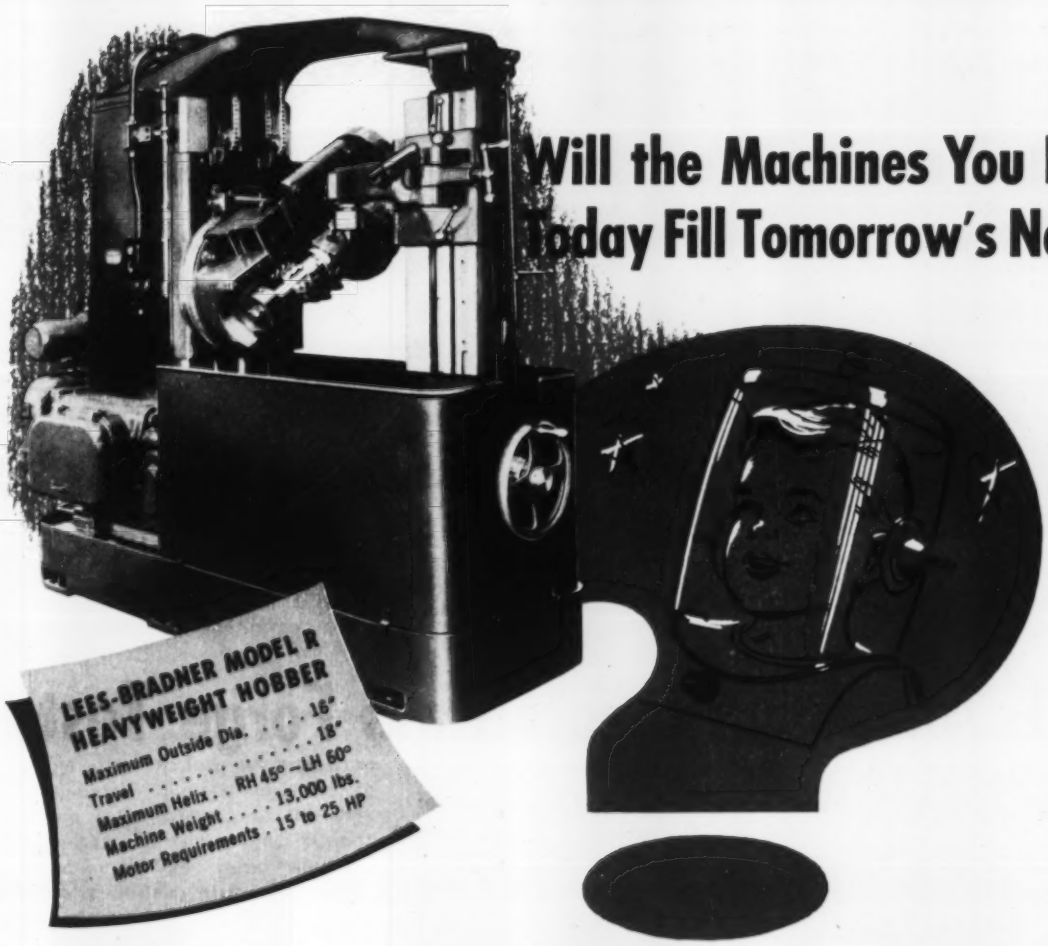
Coil Styles—The precoated coil is produced in a wide range of colors from one end of the spectrum to the other, permitting fabricators to select those best suited to their products. Uniformity of finish enhances appearance of the finished product. Finish is bonded to the metal by a phosphatizing process to permit stamping, piercing, intricate embossing and drawing without damage to the finish.

Enamel strip is made in steel (cold-rolled, electro zinc bond or tin plate), brass, zinc, aluminum or any other base material which will take a coating. It is furnished in widths from 7/32 inch up to 30 inches, and in thicknesses ranging from 0.006 to 0.040 inch. Fabricators also have a wide choice of finishes from alkyds, ureas, alkyd-ureas, vinyls, oleo-resinous, formaldehydes, sanitary lacquers, epons, plastics and semiplastics and adhesives.

Chromium-Nickel Specs

Latest specifications covering stainless steel filler metals for use with the inert-gas-metal arc process have been issued by ASTM and AWS. They include corrosion-resisting chromium and chromium-nickel steel welding rods and bare electrodes. Thirteen classifications of filler metal are established by these specifications.

Copies may be obtained for 25 cents by writing to the American Society for Testing Materials, 1916 Race St., Philadelphia, or American Welding Society, 33 W. 39th St., New York 18.


LEES-BRADNER MODEL R
HEAVYWEIGHT HOBBER
Maximum Outside Dia. . . . . 16"
Travel . . . . . 18"
Maximum Helix . . RH 45°—LH 60°
Machine Weight . . . . 13,000 lbs.
Motor Requirements . 15 to 25 HP

Will the Machines You Buy oday Fill Tomorrow's Needs?

How about that machine you're thinking of replacing today? Awhile back it looked pretty good, didn't it? Good enough to fill your needs when you bought it, anyway. But now it can't handle today's job and it must be replaced.

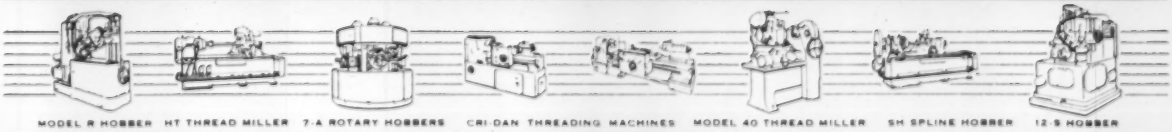
When you buy that new machine—*look ahead.* Don't invest in one that just barely meets today's needs. Think about that extra capacity you'll probably need tomorrow.

Lees-Bradner manufactures a full line of hobbing machines to meet different requirements. If a smaller capacity machine will do your job today—*and tomorrow*—fine, that's for you.

But if you suspect you'll need higher speeds, faster feeds and greater production capacity in the near future it's wise to gear your thinking and purchasing accordingly.

The LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.



MODEL R HOBBER · HT THREAD MILLER · 7-A ROTARY HOBBERS · CRI-DAN THREADING MACHINES · MODEL 40 THREAD MILLER · SH SPLINE HOBBER · 12-S HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER

Prior to the initial upsetting, the 70-inch ingot of 24S alloy is positioned on the 7000-ton press. After upsetting, right, initial height has been reduced to 36 inches. Temperature is being checked before next operation

GIANT Aluminum Ingots Pass Forge Test

With Air Force heavy press operation close at hand, Kaiser finds out its 32-inch-diameter, 70-inch-long ingots will successfully press forge. Blooms come out very sound

By W. S. PETERSON
Section Head
AND
J. J. WEGNER
Research Engineer

Department of Metallurgical Research
Kaiser Aluminum and Chemical Corp.

SEVEN of the largest 24S aluminum alloy ingots ever produced, measuring 30 inches in diameter by 70 inches in length after scalping and cropping, and weighing more than 5000 pounds each, have been successfully press forged into 13 x 42 x 85-inch plate blooms. These blooms will be rolled to high quality heavy plate.

The ingots, cast by Kaiser Aluminum's department of metallurgical research, are a direct result of several years of intensive research. This work was undertaken to develop sound ingots that would be big enough to supply the amount of metal needed in the large forgings which will be made in the giant presses being constructed by the Air Force in its heavy press program.

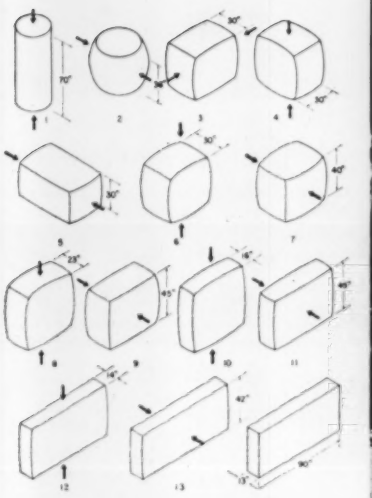
Production of high quality 32-inch diameter ingots of alloys 14S, 24S and 75S is now routine. However, this was the first attempt to forge aluminum alloy ingots of this size. Forging was successfully completed at the Homestead Works of U. S. Steel Corp., Munhall, Pa.

Ingot Quality — Despite their large cross section, the 32-inch diameter 24S alloy ingots exhibited an unusually high degree of soundness. They were free of cracks, massive segregation, inclusions, and porosity produced by shrinkage or gas evolution. The 8 inches or so of pipe in the head of each ingot was removed by sawing. Soundness of these ingots was checked in the as-cast stage and after scalping, by an ultrasonic reflectoscope.

As a further check on the soundness of the metal employed in this forging work, transverse slices were taken from each ingot for intensive metallurgical examination. General freedom from porosity was exhibited by a highly sensitive test in which dye penetrant and developer were applied to the machine surfaces of slices cut from the ends of the ingot. In addition to freedom from porosity, these massive ingots contained fine grain and fine, uniformly distributed constituents.

These tests proved that quality of the 32-inch diameter 24S alloy ingots is generally superior to that normally found in today's ingots of smaller sizes.

Ready For Forging—Two large car-type under-fired gas furnaces were used to heat the ingots evenly prior to forging. Heating from room temperature to 700° F was done over a period of about 30



The schematic drawing above shows the 13 forging operations planned in advance to obtain grain refinement through forging. The arrows indicate work directions

The finished plate blooms are 13 x 42 x 85 inches, the 42-inch dimension being parallel to the original 70-inch height of the 5000-pound 24S aluminum ingot

hours. This was followed by soaking at 700° F for 12 hours.

The over-all forging procedure consisted of 13 steps, as shown in sketch form above. In the first step the 70-inch high, 30-inch round cylinders were squeezed down to 36-inch high beer-barrel-shaped pieces. In the following steps, 2 to 5, these pieces were cross worked at right angles to a 30-inch square.

Die Change—At this point the limitation of the 7000-ton hydraulic press was reached, necessitating a change to a die with a smaller area. This die change made it necessary to reheat the pieces before step 6. If the press capacity had been greater, complete forging of the ingots to the finished plate blooms could have been accomplished without this reheat.

This first phase of the forging operation took about 30 to 45 minutes press time per ingot. There was a surface temperature loss of about 50° F in bringing ingots from the furnace to the press. However, a surface temperature rise of about 50° F took place during pressing so that the temperature at the end of this first phase was about that of the original ingot coming from the furnace.

During the die change the pieces were reheated to 740° F to 760° F. Pieces were then drawn down to the desired plate bloom size of approximately 13 x 42 x 85 inches, the original long axis of the ingot being parallel to the 42-inch dimension. This second phase required about 45 minutes of press time per piece.

Some Conclusions — The limitation of the 7000-ton press points up the fact that presses of considerably greater capacity will be needed for efficient low cost forging of ingots of this size.

All seven ingots forged in an excellent manner and the metal recovery was 100 per cent. Thus, these large aluminum ingots passed with flying colors this first and highly critical hurdle in their conversion to high quality heavy plate forgings. Successful cross working of the 32-inch diameter 24S alloy aluminum ingots to the 13 x 42 x 85-inch plate blooms is directly attributable to the high degree of soundness and excellent metallurgical structure of the original ingots.

Aluminum vs. Steel — Forging these 5000-pound 24S aluminum alloy ingots on a 7000-ton hydraulic press designed to handle 200-ton steel ingots offered some interesting points of comparison between aluminum and steel.

The press operators were not impressed with the size of the ingots, but they were surprised by the resistance of aluminum to deformation. In contrast to steel which forges rapidly, the forging of the aluminum was relatively slow. The actual press reaction was gradual; as more work was put into the ingot and the cross sectional area of the piece increased, the deformation declined to a point where the press was virtually stopped.

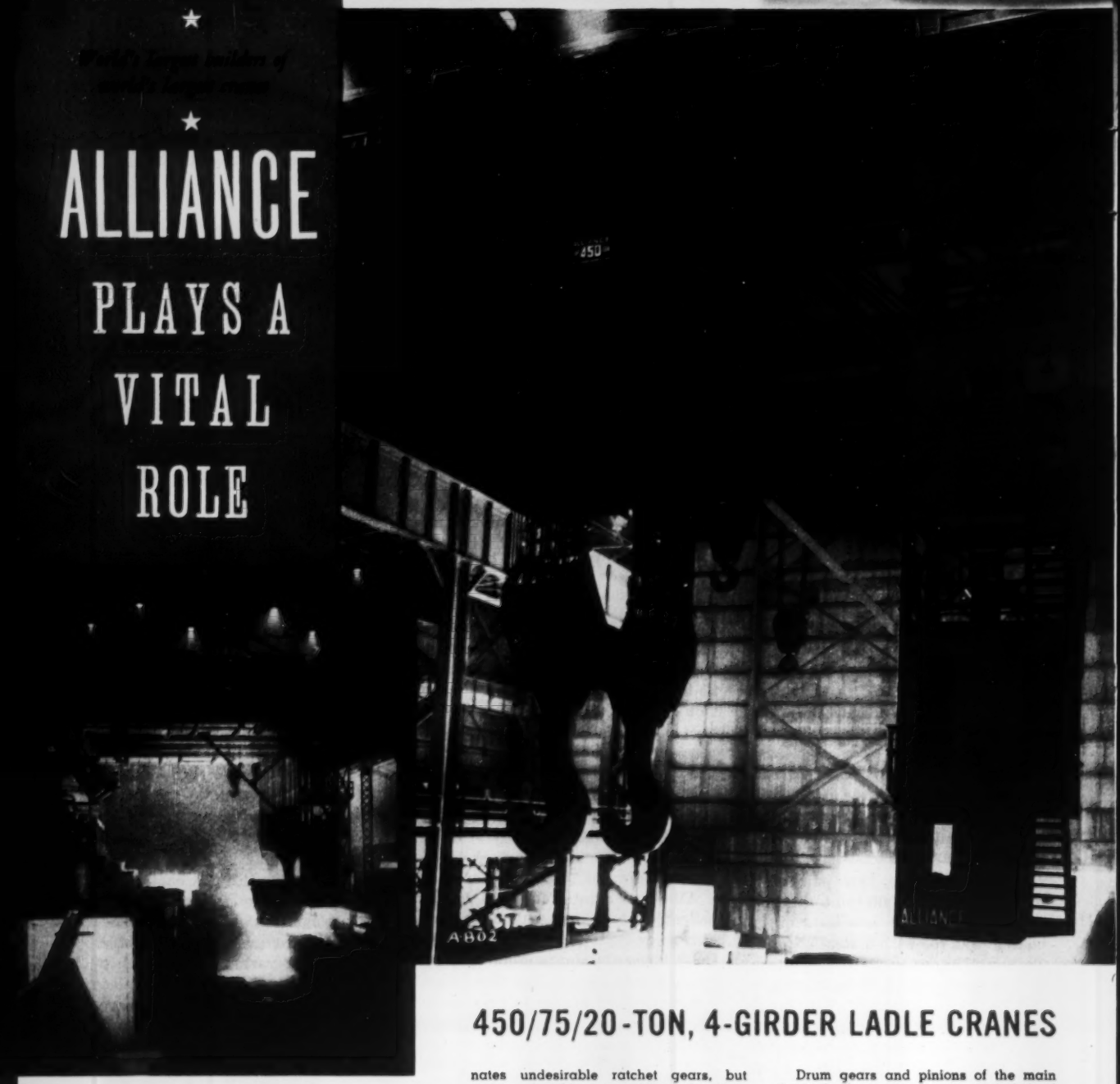
No "Red Heat"—Press operators were accustomed to handling steel ingots well above a red heat. Since aluminum at forging temperatures has the same color and appearance as at room temperature, the forger had no color yardstick by which to go, and therefore, the complete forging operation had to be carefully directed by the pit man.

Although there is no scale problem in the forging of aluminum, the forging dies had to be thoroughly cleaned, heated and periodically lubricated with a medium heavy oil and graphite mixture to prevent tearing or galling as the ingot was formed under pressure.

The far reaching effects of producing aluminum forgings of this size can only be speculated upon at the present time. There is little doubt, however, that manufacturers and processors alike will welcome successful completion of this work which signals the availability of large high-quality aluminum forgings.

World's largest builders of world's largest cranes

ALLIANCE PLAYS A VITAL ROLE



450/75/20-TON, 4-GIRDER LADLE CRANES

When the engineers from the Construction Engineering Bureau of the United States Steel Corporation were in the market for the world's largest ladle cranes for Fairless Works, they consulted The Alliance Machine Company, whose experience and know-how qualified them for this important task.

One of the cranes Alliance designed, which is now operating in the Fairless Works, is this 450-ton ladle crane. Having a 69'6" span, this crane is equipped with a 2-motor, synchronized worm drive and double-drum interlocked type main hoist. The synchronizing shaft employed in the gearing scheme not only eliminates undesirable ratchet gears, but makes possible an additional safety feature in case one hoist motor fails. Under this condition, both worms are driven by the remaining motor. All gearing functions continue as though operated with two motors. In case of hoist motor failure on the conventional drive **without** the synchronizing shaft, hoisting is accomplished by **only one** set of gears, thus imposing a double load on active gearings, as the second drum is then driven through interlocking drum gears.

Hoist gearing is so proportioned that full crane capacity can be lifted by one motor without exceeding the quarter-hour rating.

Drum gears and pinions of the main hoist have precision-cut, single-helical teeth. This feature, in cooperation with the worm drive, provides vibrationless operation on either high- or low-speed hoisting and lowering.

All gears of this new Fairless Works crane are fully enclosed and operate in a bath of oil, assuring long life and low maintenance. The 4-part safety rope system affords the highest degree of safety in rope reeving.

This crane is equipped with a 5-story cab, the operator's compartment being air-conditioned.

Consult Alliance Machine Company engineers when you have a heavy material handling problem.

THE *Alliance* MACHINE COMPANY

MAIN OFFICE
ALLIANCE, OHIO

PITTSBURGH OFFICE
1622 OLIVER BUILDING, PITTSBURGH, PA.

NEW PRODUCTS and equipment

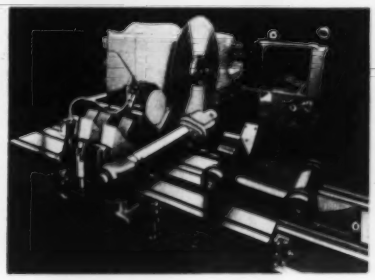
Reply card on page 153 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Sawing Machine

. . . cuts ferrous, nonferrous

For cutting off ferrous or nonferrous material, a larger No. 5 model circular sawing machine to cut stock up to 43 inches in diameter has been added to the Motch & Merryweather line.

Saw carriage is mounted on a heavy base at right angles to a



heavy tee-slotted work-supporting table. Saw carriage, single speed type, has additional feed variations available by means of sheave change or by change gears. Saw head is powered by a 30-hp 900-rpm motor connected by multiple belts and sheaves to the gear train. Motch & Merryweather Machinery Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Electrocleaner

. . . for copper and alloys

Oakite composition No. 191 has been developed for electrocleaning copper and its alloys prior to plating. It's reported to possess special ingredients that reduce tarnishing of work in the higher-temperature cleaning ranges, or where long treating cycles or prolonged transfer periods may occur.

Among the advantages claimed are: Long solution life; broad current-density range; wide temperature range; cleans at low concentrations; removes buffing dirt and other common soils rapidly. Oakite Products Inc.

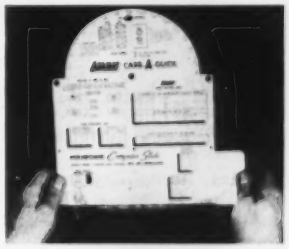
FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Carb-A-Guide

. . . dial and slide chart

A combination dial and slide chart called the Carb-A-Guide will put detailed carbide application information at your fingertips.

By turning the dial to the type material to be machined, the guide shows proper speed, carbide grade, tool angles and chipbreaker dimensions for the user's feed and depth. A speed conversion slide,



a milling feed slide and a horsepower computer slide are also included. Adamas Carbide Corp.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Nickel Plating

. . . easier to control

An improved nickel sulfamate plating process is reported to be faster, more versatile, easier to control, able to produce harder deposits with less brittleness.

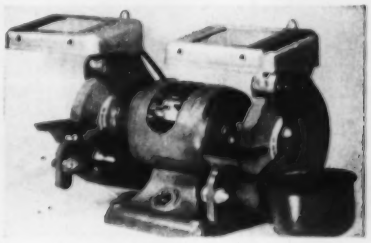
This bath has high conductivity and excellent anode corrosion. Anode and cathode efficiencies are in close balance. The bath is not sensitive to impurities. If excessively contaminated, it can be purified with activated carbon and low current density electrolysis. Hanson-Van Winkle-Munning Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Grinders, Buffers

. . . higher starting torque

Basic improvements in all single-phase and three-phase models of its standard 7-inch grinders and buffers have been announced by Delta. They are designed to



offer higher starting torque, higher breakdown torque, lower operating costs and greater adaptability.

Dual voltage allows the single-phase models to operate on either 115 or 230-v current and three phase on 220 or 440 v. Oval shaped motor end bells and an extended motor shaft combine advantages of greater rigidity and more working clearance. Delta Power Tool Division, Rockwell Mfg. Co.

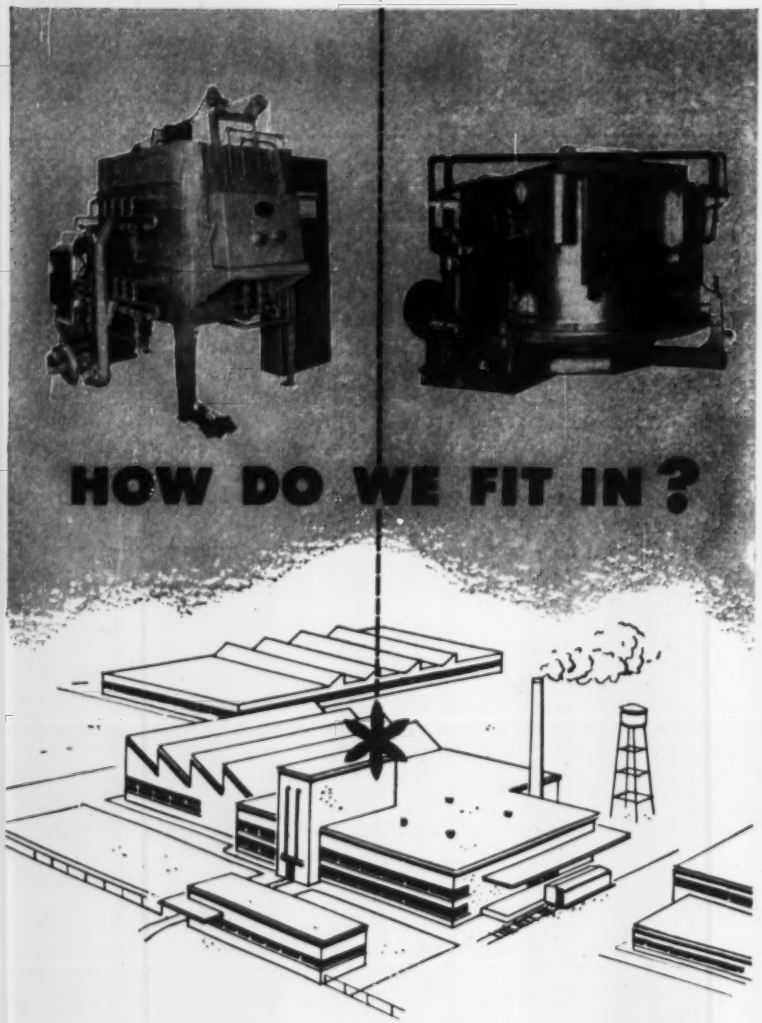
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Shell Molding Machine

. . . 40 to 60 shells per hour

This Pneudraulic model shell molding machine makes shell molds for producing castings of great accuracy and exceptionally fine surface finish. Molds are 12 x 18 inches.

Production rates of 45 to 60



Busy, busy, busy. An extremely busy man is the metal plant executive, especially when a new plant or plant modernization is the order of the day . . .

Busy, busy. Material handling equipment, conveyors, cranes, electric motors, lathes, presses, grinders, valves . . .

How do we fit in? Here's how:

Our company manufactures furnaces for forging and heat treating — and it's good, dependable equipment. We fit into your plans because we make rotary or straight-thru designs, continuous or batch. Our furnaces can be direct, radiant tube or convection heated. And we are particularly experienced in the high temperature field . . .

Besides, we install cooling tables and conveyors, charging equipment and manipulators — everything required to make a complete furnace line!

In your own case — how do we fit in?

SALES REPRESENTATIVES

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53 West Jackson
Chicago 4, Illinois

CHRISTY FIREBRICK CO.
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St. Louis 1, Missouri

DAVID S. REYNOLDS
34 Alderwood Road
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THE GAS MACHINERY COMPANY
16116 WATERLOO ROAD
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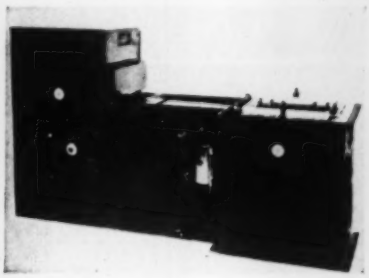
Designers • Fabricators • Erectors
Gas Plant Equipment and Industrial Furnaces

THE GAS MACHINERY CO. (Canada), Ltd.
HAMILTON, ONTARIO

NEW PRODUCTS and equipment

shells per hour can readily be maintained. Investing and curing time are automatically controlled



by a timer. Radiant oven is used to heat the pattern as well as cure the shells. Centrifugal Casting Machine Co.

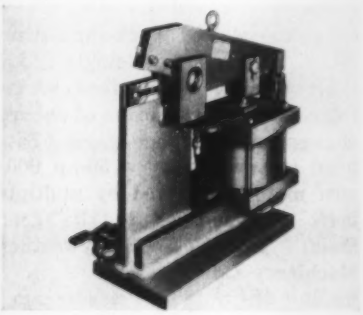
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Air-Operated Shear

. . . no motors or gears

An air-operated shear for cutting cold ferrous and nonferrous bars up to 1¼ inches in diameter is reported to occupy less than one-quarter the floor space, with weight less than half that of conventional models.

The unit operates from any standard shop air supply or compressor at pressures from 60 to 125 psi. It has no motors or gears



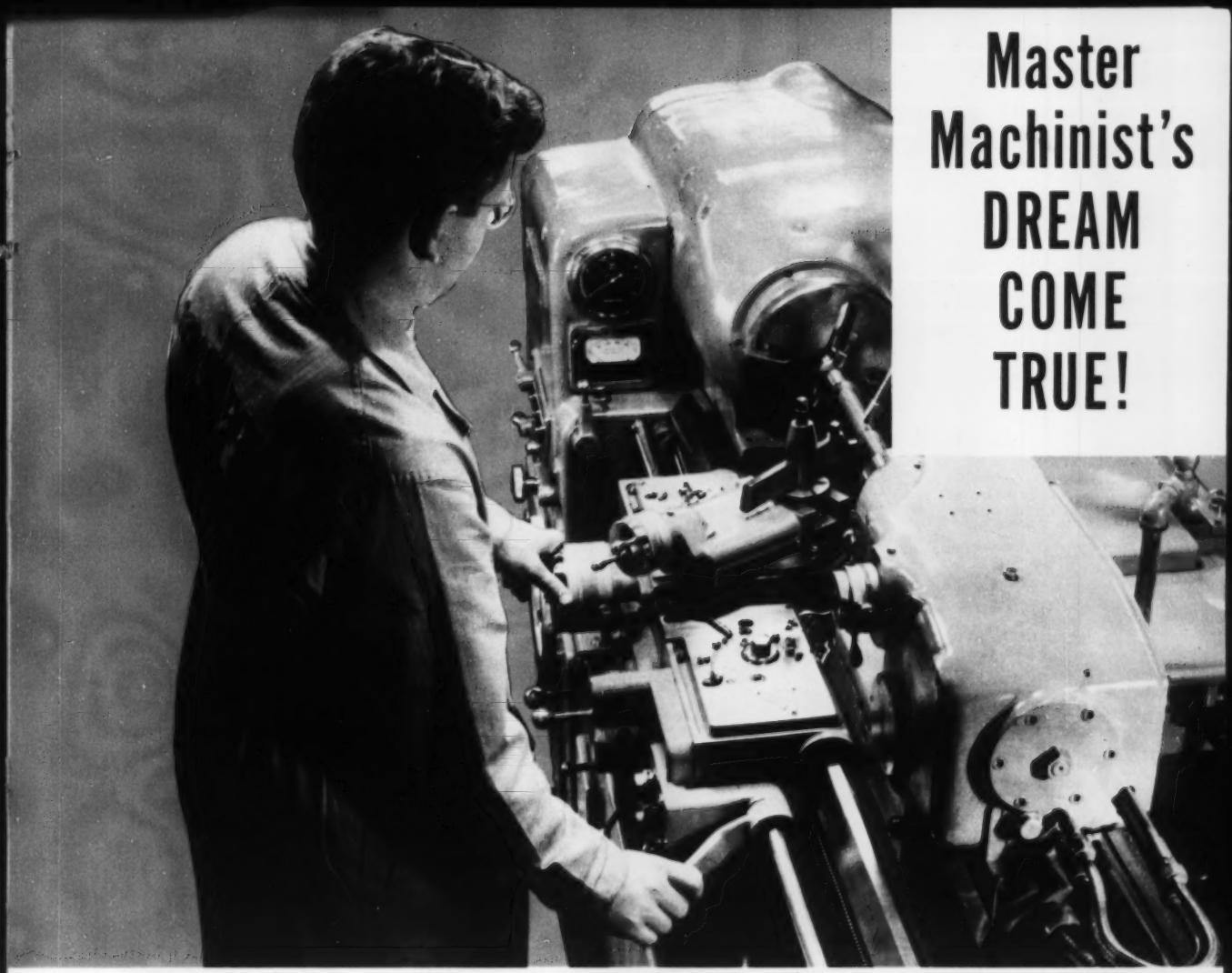
and, with practically no wearing parts, a minimum of maintenance is required. It operates only while cutting, thereby offering additional economy and safety features. It has 6-inch knives with 4 cutting edges. Curry Air Shear Corp.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Speed Reducers

. . . shaft mounted

Shaft mounted speed reducers offering operating advantages in space saving are available from



Master Machinist's DREAM COME TRUE!

First and only truly dual-purpose lathe, with features never offered together before...the Monarch 13″ model EE precision lathe

It's a toolmaker's lathe—and it sets new standards in high work output. It's a manufacturing lathe—slashing turning time with toolroom accuracy and finish. It will do any turning job within its capacity better and faster, as a look at the partial list of features will assure you. It offers flexibility unlimited with *complete* control concentrated at the apron—66 thread and feed changes—full accessory complement as regular equipment. It's built for the utmost in ruggedness, ease, accuracy and speed. Write for our Booklet #502 with the complete 13″ Model EE Lathe story.

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio

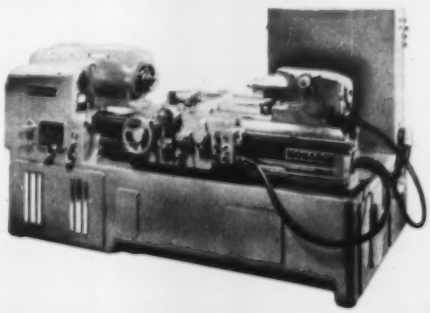
Monarch makes a 10″ Model EE, too. Turn the page for details.

You Get All This in the Monarch 13″ Model EE

1. Built-in constant surface cutting speed. Most efficient cutting speed, always—improves accuracy and finish—reduces some facing times up to 50%.

2. Infinitely variable speeds up to 2000 R.P.M. With 15 H.P. variable speed motor delivering 4 overlapping ranges, number of speeds is limitless. High speed range direct to spindle thru multiple "V" belts.

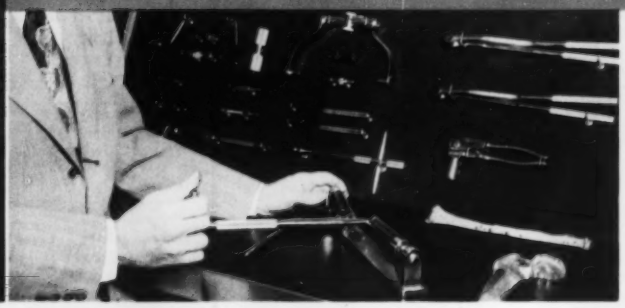
3. Electric speed change. Practically instantaneous. Accomplished from operator's normal position at apron. No calculating of lever settings by reference to an index plate is needed.



4. Four-way rapid tool traverse. Cross and longitudinal movements are provided by individual motor drive. Cuts tool adjust time 50%.

5. Unique hydraulic tailstock. Hydraulic positioning and clamping at the touch of a button. Hydraulic feed and traverse to spindle. Easiest drilling and reaming you ever saw!

Just What the Doctor Orders!



Example of sensitivity and precision without equal... from the Monarch 10″ model EE toolmaker's lathe

Doctors' orders are especially exact when it comes to these delicate but powerful, precision bone surgery instruments. To satisfy them, you need the finest machining equipment on the market.

Above you see a turning operation in the shop of Dallas R. Trinkle and Sons, famed orthopaedic engineers *and* master machinists. The part being turned by Perry Trinkle is, of course, of surgical steel. The machine is our 10″ Model EE Sensitive Precision Toolmaker's Lathe—a machine on which the Trinkles rely exclusively, because of its deft exactness in turning, boring and facing; its unlimited versatility; and because it has already given them over 40,000 hours of dependable, trouble-free service.

Perhaps your turning requirements aren't this refined. Still—wouldn't this kind of accuracy, speed and sensitivity help your production too? Let us send you our Booklet #302 giving complete information about our 10″ Model EE. Just write . . .

THE MONARCH MACHINE TOOL COMPANY, Sidney, Ohio

Monarch

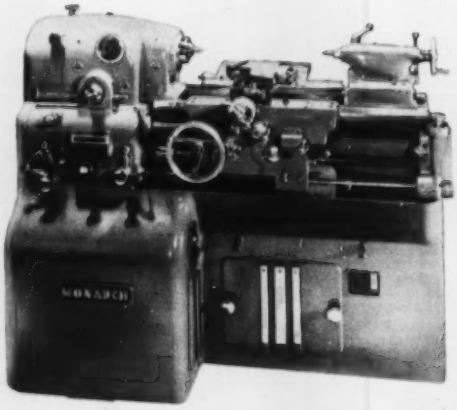
ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A GOOD TURN FASTER—TURN TO MONARCH

Turn to preceding page for report on the companion 13″ Model EE Precision Lathe.

Monarch 10″ Model EE features



A true high speed lathe for small work. Available with speed ranges up to 40 to 4000 R.P.M.

All electric drive direct to spindle through multiple "V" belts. No gears in headstock.

For thread chasing up to 100% faster, has exclusive combination of electric lead-screw reverse and variable reverse speed control.

The only small lathe available with anti-friction bearing taper attachment.

Easy, fatigue-free operation. Base design lets operator work close in comfort. He gets production—not backaches.

Totally enclosed, automatically lubricated end gearing and gear box.

Flame hardened and ground ways for both carriage and tailstock. Bed all in one piece—no inserts.

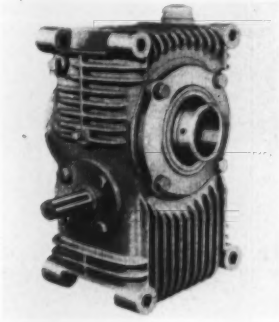
American Standard Camlock spindle nose—3″ Type D-1.

Over 6000 10″ Model EE machines in use today.

The 10″ Model EE—sensitive and exact as a great surgeon's hands—versatile as the venerable country doctor. Manufacturing and Toolmaker's models. With Monarch Air-Gage Tracer, they become high-output production machines noted for speed, accuracy and high finish.

Cone-Drive Gears Division. The reducer is mounted directly on the driven shaft and requires only a simple bracket or torque arm to prevent it from rotating about the shaft.

The reducers are being manufactured in three sizes: 2, 2½ and 3-inch center distance, and



can be furnished in pinion under, pinion over or vertical shaft models. Loads that can be handled by the three sizes of the reducers range from fractional horsepower to 3, 5½ and 9 horsepower, respectively. Michigan Tool Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

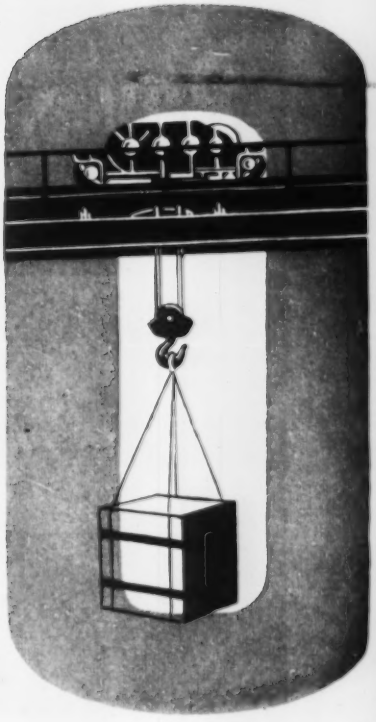
Radial Play Gage

. . . measures three sizes

A constant-load gage to measure assembled roller and ball bearings for radial play between outer

and inner races has excellent application as an industrial type gage.

Dead-load pressure is used instead of spring pressure. Air is used to relieve weight pressure



A step toward automation is equipment for faster, less costly handling of heavy materials; cranes, custom designed for specific applications. Conco engineers can design such cranes — the right lift, the right speed, the right clearances. Thirty seven years experience are behind every Conco Crane recommendation. Request a Conco representative to call and discuss your problem. Or, write for Bulletin 3000A covering the complete Conco Crane line.

CRANES HOISTS
CONCO

CONCO ENGINEERING WORKS
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AFFILIATES:
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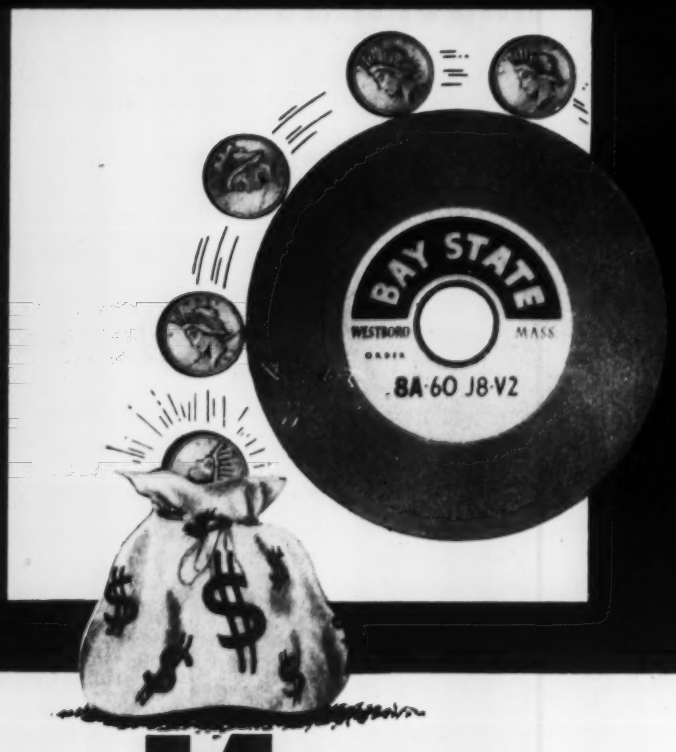
Bay State 8A Vitrified Bonded Grinding Wheels



. . . Save 14 %

Example: Basic† price of a premium-price "White" wheel 7" x ½" x 1¼" is $4.78. Basic price of a BAY STATE 8A wheel of same size is only $4.10. *SAVING IS $.68 ON A SINGLE WHEEL . . .* or 14%!

What's more . . . these 8A wheels give you fast, free, cool, cutting-action plus minimum dressing and long life. This means *MAXIMUM ECONOMY* for your tool grinding operations.

8A is still another example of Bay State's "Wheels of Progress!"

†Basic prices are subject to discount.

Send for literature which includes listing of stock wheels with proven specifications.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U. S. A.
Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

Manufacturers of all types of Quality Abrasive Products

while inserting the bearing. Weights can be made to suit customers' requirements. Adjustable to measure three sizes of assembled bearings from 1 to 5 inches outer race O.D., the gage can be modified to check any bearing size within that range, or made to accommodate still larger or smaller bearings. Federal Products Corp.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Compound Saver

. . . for continuous check-up

To show at a glance that the right amount of metal washing compound is being used in a metal washing operation, the Econometer was developed.

It is not wired or piped into the machine. Instantly ready for work

as soon as it is plugged into any light socket, it prevents waste of compound, or failure to clean. The operator has a continuous check-up on how the washing job is being done. DuBois Co. Inc.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Test Unit

. . . for magnetic particles

A Norelco magnetic-particle test unit called Portaflux, weighing 45 pounds, is easily carried into confined spaces. The unit is designed

to locate surface defects in rough castings, bar stock, forgings and shop welds.

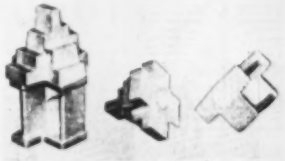
Research & Control Instruments Division says that objects to be checked are magnetized either by passing a current directly through the metal or through a surrounding cable in the form of a coil. Magnetic iron oxide or precipitated iron powder is distributed over the surface of the magnetized object and alignment of the particles is such that the defect is clearly located. North American Philips Co. Inc.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

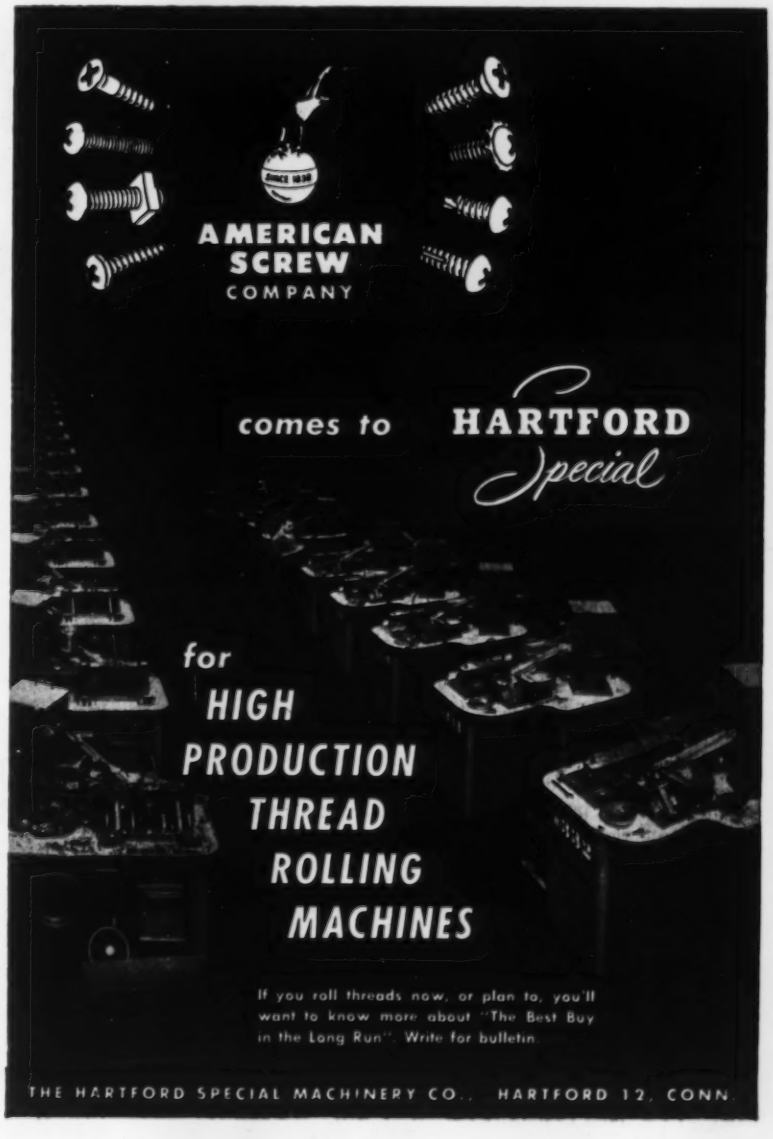
Set-Up Blocks

. . . made of aluminum alloy

New multi-step set-up blocks made of aluminum alloy will with-



stand great weight under clamping pressures. Softer than the



Here is the

PARKER LINE

metal surface treatments that aid production, improve product quality, enhance appearance and durability...

BONDERITE

corrosion resistant paint base

This well-known product is used to prepare metal for fine baked paint finishes on thousands of products. Automobiles, trucks, refrigerators, domestic appliances of all kinds, control boxes, metal furniture, office partitions, transformers, and toys are a few of the types of products on which Bonderite is used.

Applied by either spray or immersion, Bonderite creates a nonmetallic phosphate coating over the entire surface. This coating is integral with the metal surface, forming an effective barrier against the penetration of moisture, and furnishing an excellent base for paint.

Bonderite produces dependable results of uniformly high quality, is easily controlled and economical in operation. It may be used to treat steel, aluminum, zinc, and cadmium.

Bonderite adds durability and appearance protection to painted metal by combating corrosion and anchoring the paint securely.

PARCO COMPOUND

rust resistant

This is the standard corrosion protection for iron and steel.

Iron and steel parts to be treated are immersed in Parco Compound solution, which creates a nonmetallic crystalline phosphate coating over all the surfaces of the metal. Complex shapes of all sizes from steel boat plates down to nuts, bolts and screws are treated with Parco Compound. Treatment is simple, controls are easily maintained, and cost is extremely low.

BONDERITE and BONDERLUBE

aids in cold forming of metals

These two Parker products are a big factor in accomplishing the present revolution in cold forming techniques. Nonmetallic Bonderite, used in tube mills for many years to hold lubricant, protect dies from excessive wear, and allow greater reductions—combines with the amazingly effective Bonderlubes to transform problem draws and extrusions into production routine.

The combination of Bonderite and Bonderlube is used extensively in the manufacture of shells and cartridge cases, shafts, gears and pins, making important savings in time, money, and material.

PARCO LUBRITE

wear resistant for friction surfaces

The nonmetallic phosphate coating created by this Parker Product reduces wear on friction parts and bearing surfaces. It is used on gears, pistons, piston rings, shafts, valves, pinions, cylinder linings, cams and other automotive and machine components.

Parts are treated by immersion in Parco Lubrite solution. The coating produced by this treatment prevents metal-to-metal contact, holds lubricants, reduces danger of galling and scratching, prolongs service life by protecting mating parts during the critical break-in period.

PARCOLACS

special finishes

Parcolacs are a group of special finishes to be used over Parco Compound. They include wax base finishes, stains, and rust preventive oils suitable for application by dip, spray, or centrifuge. There are types to meet slow or fast drying requirements, and other desired specifications. Parcolacs add to the appearance and performance qualities of the articles treated.

NEW! PARCOLAC BLACK AND PARCOLAC ALUMINUM

Two new Parcolac finishes can now be used over Parco Compound to enhance appearance and add greater corrosion resistance. Parcolac black and Parcolac aluminum are phenolic type finishes, applied by centrifuge, with excellent color and appearance and especially good resistance to corrosion. Excellent for parts that will be called on to withstand severe exposure and maintain good appearance.

ENDURION

corrosion resistant treatment in gray and olive drab

Two distinctive immersion treatments designed to react chemically with Parco Compound coatings to produce superior corrosion resistance. Easily controlled, simple to operate, Endurion produces uniform coatings which do not materially change the dimensions of the parts being treated. Very little additional equipment is required.

Endurion treatments are recommended where increased corrosion resistance is specified or where the chemically produced permanent colors are required.

PARCO CLEANERS

metal cleaners and conditioners

This line of scientifically formulated metal cleaners includes alkali, acid, and emulsion type cleaners. They not only remove grease and soil from the metal, but condition it for the next step in finishing. The line is complete, and includes one that can meet your production cleaning requirements.

**Bonderite*, *Bonderlube*, *Parco*, *Parco Lubrite*—Reg. U. S. Pat. Off.*

MAINTENANCE PAINTS. A complete line of maintenance paints manufactured for 70 years by The Tropical Paint & Oil Co., subsidiary of Parker Rust Proof. A product to meet each and every one of your maintenance paint problems.

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RUST PROOF COMPANY

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_____

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Name _____

Firm _____

Address _____

machine table, the blocks absorb metal chips even if dropped, absorb the nicks and scratches without injury to the machine table.

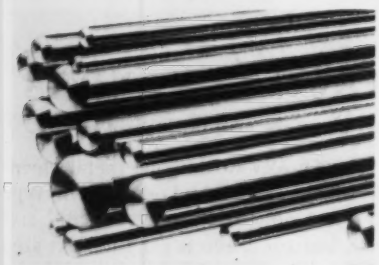
They hold work from 0 to 3 inches and can be mounted on 3-inch Jergens risers and thus pyramided to any desired height. Blocks allow rotation to coincide with sturdy tee base for maximum rigidity. Jergens Tool Specialty Co.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Stressproof Bars

. . . available as stock item

Stressproof steel bars are now available through steel ware-



houses to maintenance men for repair and replacement use.

Strength, wearability to replace practically any alloy or heat-treated carbon steel bar, and good machinability, are claimed for the bars. They are available in rounds from $\frac{3}{8}$ inch through $3\frac{1}{4}$ inches and in hexagons from $\frac{3}{8}$ inch through 2 inches. LaSalle Steel Co.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Enamel Stripper

. . . thin, clear liquid

An enamel stripper, S-18, to remove Epoxy-type enamels and most other chemicals is announced by Enthone.

The stripper is operated at room temperature and removes enamel by a wrinkling action. Stripper and loosened enamel are removed from the work by means of a water rinse. A water seal is used on the stripper to reduce evaporating losses. It is nonflammable, mild in odor and pleasant to use. It is suitable for removing enamels from brass and other base metals including aluminum and steel. Enthone Inc.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 153 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Leaded Alloys

A. M. Castle & Co.—Factual case history proof of how the new leaded alloys can help you in cutting costs, meeting price competition and satisfying the demands of cost-conscious customers is presented in a report just released. Nine major advantages are listed with illustrated case histories.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Carbon Steel

Republic Steel Corp.—A 15-page catalog titled "Hot Rolled Carbon Steel, Semi-Finished Bars and Skelp" lists the sizes of these products which Republic is equipped to roll.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Hydraulic Valve

Rivett Lathe & Grinder Inc.—New line of their sub-plate mounted, solenoid operated hydraulic valves is described in Catalog No. 260. JIC diagrams show flow operations under all types of action for every one of the 14 piston designs in which the new valve is offered.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Maintenance Bronze

American Smelting & Refining Co.—Continuous-Cast Products Department has issued a bulletin describing in detail the patented Asarco Continuous-Cast process by which a variety of bronze alloys is cast into rods, tubes and shapes of different diameters and profiles. Six pages show how this process saves money in factory maintenance and production.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

Pneumatic Products

C. A. Norgren Co.—A 56-page catalog covers Norgren's line of lubricators, filters, regulators, valves, hose and assemblies. Each is described and illustrated, with operating features, sizes and characteristics clearly shown.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Broach Sharpeners

Colonial Broach Co.—A complete line of broach sharpeners for round and flat broaches and universal broach sharpening has been detailed in a 4-page bulletin. Bulletin S-54 points out various design features of their sharpeners and goes into considerable detail on each with regard to operating details, standard and special equipment and specs.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Precision Cylinder Grinders

Landis Tool Co.—A new edition of the 28-page catalog of Landis precision cylindrical grinders illustrates universal, plain, roll, centerless and special-purpose grinders for cranks, cams, pistons, valves and similar parts. Included is a brief description and specifications for each machine.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Cold Rolled Steels

Crucible Steel Co. of America—Up-to-date information on cold rolled specialties, including stainless, alloy and carbon spring steels, is given in a booklet describing facilities, capacities and products of the Spaulding Works. It discusses melting, condition or temper, edge, finish and packing.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Aluminum Heat Exchangers

Aluminum Co. of America—Alcoa's new booklet presents the complete story on aluminum heat exchanger tubes, emphasizing factors that provide the combination of low cost and corrosion resist-

With the largest stock of the new
LEADED ALLOYS
To be found anywhere in the U.S.A.
A. M. CASTLE & CO. can give you
IMMEDIATE DELIVERY
on a wide range of grades and sizes of both hot rolled...and...cold finished --and help you cut your production costs
Here are 5 major advantages you can gain with the new leaded alloys--
1--INCREASED PRODUCTION With leaded alloys machining speeds can be stepped up at least one third...and...often much higher. Result: output is increased 33% and more.
2--GREATER TOOL LIFE Because of low friction component...and...free breaking chip removal leaded alloys result in much longer tool life and more parts between tool grinds
3--FINER SURFACE FINISH The new leaded alloys machine to a fine, smooth, satin finish--often eliminating one or more cost-increasing extra finishing operations.
4--LOWER UNIT PART COST High machining speed, freer cutting, plus a larger number of parts per hour add up to--greatly decreased cost per unit part produced.
5--SAME PHYSICAL PROPERTIES Leaded alloys have the same physical properties, hardenability, and heat treating characteristics as the non-leaded alloys of same analysis.
For more facts on the new leaded alloys...and...case history proof of how they can help you in cutting costs...meeting price competition...and...satisfying cost-conscious customers--mail the handy coupon below right away. You won't obligate yourself in the least.
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We certainly are interested in cutting costs...and...meeting competition. So, please send us your illustrated broadside containing facts and data on the new leaded alloys.

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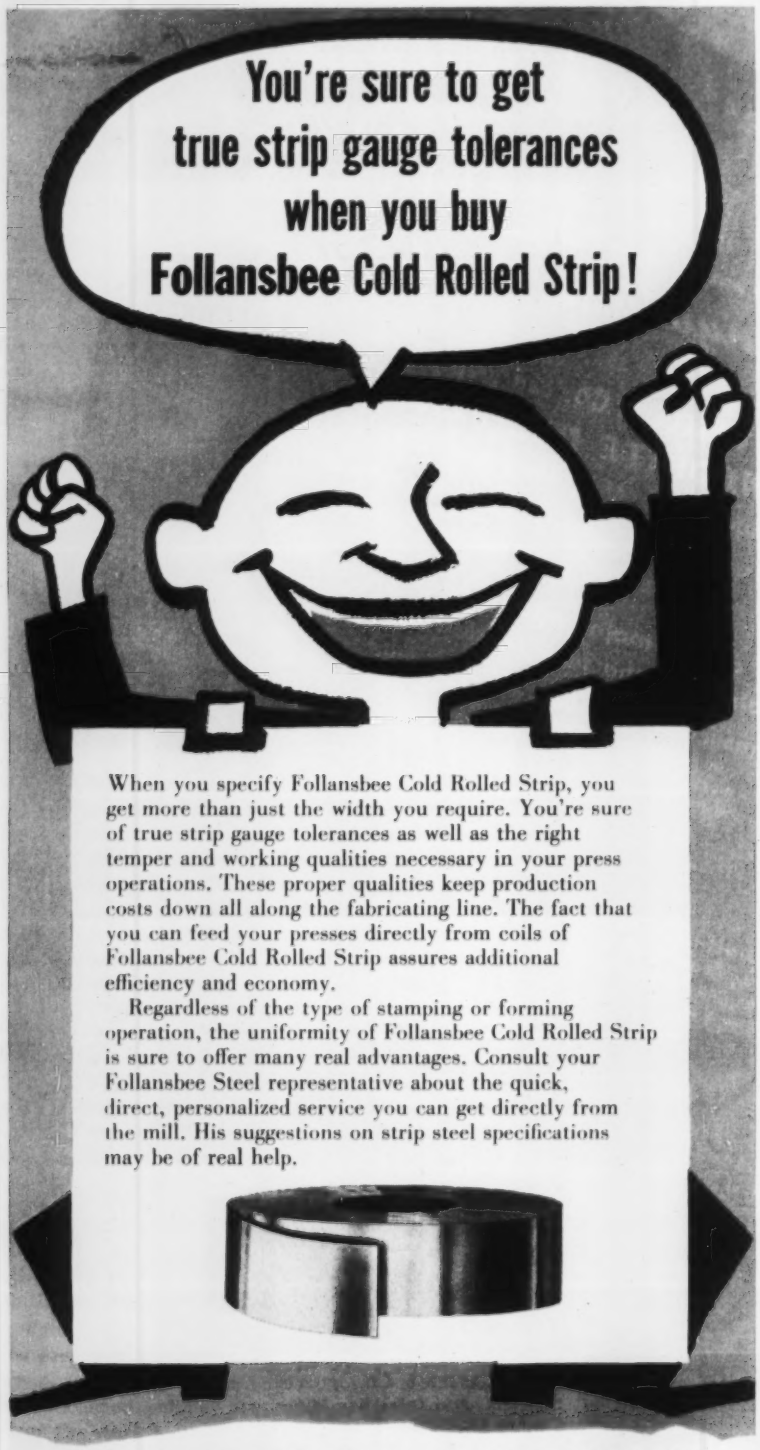

When you specify Follansbee Cold Rolled Strip, you get more than just the width you require. You're sure of true strip gauge tolerances as well as the right temper and working qualities necessary in your press operations. These proper qualities keep production costs down all along the fabricating line. The fact that you can feed your presses directly from coils of Follansbee Cold Rolled Strip assures additional efficiency and economy.

Regardless of the type of stamping or forming operation, the uniformity of Follansbee Cold Rolled Strip is sure to offer many real advantages. Consult your Follansbee Steel representative about the quick, direct, personalized service you can get directly from the mill. His suggestions on strip steel specifications may be of real help.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING
COLD ROLLED STRIP

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Follansbee Steel Warehouses: Pittsburgh, Pa., Rochester, N. Y., Fairfield, Conn.

ance which makes them attractive to industry. Applications are pictured and discussed. General design data and alloy recommendations are included.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Stainless Wire

Fort Wayne Metals Inc.—This company offers a 4-page bulletin, "What You Can Do With Precision Stainless Steel Wire." Its application in filters, instrument springs, cabling, shielding, flexible tubing, shock absorbers and scouring pads is covered briefly.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Pattern Guide

Master Pattern & Mold Co.—"Pattern Buyers Guide" is designed primarily as an aid to those who are faced with problems of purchasing adequate pattern equipment as a phase of product design or production engineering. The pocket-size guide contains a slide chart which shows pattern recommendations by casting quantity requirements, and a complete glossary of terms.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Air-Gage

Taft Peirce Mfg. Co.—Advantages of gaging by air with the Taft-Peirce Compairator are covered in a 28-page booklet. Detailed text is supplemented with schematic drawings, diagrams and illustrations. Table of contents includes: Introduction to Air Gaging; Standard Air Circuit Diagrams; Contact-Type Gaging Members; Automatic Gaging.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Temperature Equivalents

Moeller Instrument Co.—A pocket size chart of fahrenheit and centrigrade temperature equivalents can be carried in a wallet or placed under glass desk tops for reference. The reverse side of the chart illustrates easy reading qualities of Moeller thermometers.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Core and Mold Washing

Wickes Corp.—U. S. Graphite Co. Division offers a booklet describing their Mexican core and mold washes for ferrous and nonferrous foundry practice. A comprehensive application table giving details on methods of application

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of each of their eight principal mold and core washes is included along with a Baume water requirement guide.
FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Speed Variators

General Electric Co.—A complete line of packaged speed variator drives from 1 to 200 hp is described in a 20-page publication. Illustrated, the operations and application of the basic speed variator and the additional features are shown.
FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Fluoroscopy

Westinghouse Electric Corp.—X-Ray Division offers "Industrial Fluoroscopy," which describes three methods, with techniques, specification and advantages of each. Special attention is given to the latest fluoroscopic refinements in high definition fluoroscopy.
FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Sinter Testing

Mellon Institute of Industrial Research — "Evaluation of Sinter Testing," a 7-page booklet, discusses results of these method evaluations. The paper supplies a critical look at testing procedures used to determine sinter quality.
FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Hack Saw Line

Sales Service Machine Tool Co.—A combination illustrated specification and price sheet features the ten models of the complete Keller power hack saw line, ranging from a unit driven by a ¼-hp motor to one driven by a 1-hp motor.
FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Lubricated Plug Valves

Homestead Valve Mfg. Co.—A 24-page reference book shows Homestead lubricated plug valves in full-port and venturi types, sizes up to 14 inches, with a choice of self-sealed two-piece plug or one-piece plug design. Engineering information includes principal dimension, types of control, metals, lubricants.
FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Valve Chart

Ohio Injector Co.—A valve comparison chart, listing valve figure numbers of 15 major manufacturers and the OIC equivalent valve figure numbers has been released. Gate, globe, check and angle valves in bronze, iron, cast steel and forged steel are compared. Lubricated plug valve comparisons include those made of cast steel and cast iron.
FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Control Valve

Valvair Corp.—Four pages cover operation of the Speed King control valve and how it simplifies the operation of automated equipment. Its physical characteristics are covered and the complete line listed.
FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

Coated Abrasives

Clover Mfg. Co.—A revised handbook and digest of coated abrasive technology is written in simple, understandable language. The 36-page booklet contains valuable technical information on these abrasives.
FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Centrifugal Pumps

Ingersoll-Rand Co.—Fundamentals of operation, definitions of various terms used in pump calculations and typical pump problems are covered in the 12-page "Centrifugal Pump Fundamentals"

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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form. It is written in simple language and illustrated with easily understood diagrams.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Lever Punch and Shear

Niagara Machine & Tool Works —Bulletin 79-B concisely and fully describes the new Niagara No. 5-24 deep throat hand lever punch and shear. Action photos demonstrate versatility in performing diverse punching, notching and shearing operations.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Saw Blade Chart

Victor Saw Works Inc.—Victor offers a 17 x 22½-inch two-color wall chart entitled "Use the Right Blade For Every Job." The chart is printed in high-visibility black and yellow and tabulates metal cutting data on hand, power and band saws. Three tables simplify blade selection.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

Aluminum Duct Systems

Kaiser Aluminum & Chemical Sales Inc.—A 32-page technical booklet reports results of experimental tests which demonstrate excellent smoothness of aluminum in many applications found in air conditioning duct systems. Two friction loss charts, graphic solutions for determining friction losses through fittings, charts for calculating required air volumes and rates of heat loss for ducts are included.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Axelson Lathes

Axelson Mfg. Co.—A 36-page facilities book featuring Axelson lathes is being distributed. Featured are the foundry, engineering and design departments, metallurgical control and machining operations. It is designed to give the reader an idea of the methods and procedures behind the production of heavy duty precision lathes.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Heat Exchangers

Taco Heaters Inc.—A 36-page catalog covers Taco's complete line of commercial and industrial heat exchangers. Included are capacities, sizes, dimensions and weights of fuel oil heaters, condensate coolers, Biltin water heaters for large steel boilers, tank heating units, straight tube water heaters, tanks with heating units, converters and large size water heaters.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

Machinery Mounting

Barry Corp. — Advantages of machinery mounting that keeps machines in place are covered in a 4-page folder. Actual installation photographs are included, plus a page titled "What Makes Barrymounts Different?"

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

EDITORIAL REPRINTS:

Labor Contracts

Labor's representatives will be well prepared before sitting down at the negotiating table. Will your company's representative be as well prepared? On page 78 are practical suggestions to help you negotiate the best possible labor contract.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Copper Spectroscopy

In composition control, these direct-reading devices cope with variations of impure elements as low as 0.001 per cent or alloying constituents as high as 43 per cent. STEEL's article, on page 112, shows why the devices are in operation now in many large metalworking plants.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Parts' Handling

On page 110 STEEL describes the Eastman conveyorized system which supplies parts from stockroom and halves space requirements. The system also takes care of a multitude of other production and handling ills along the way.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

Aluminum Ingots

With Air Force heavy press operation close at hand, Kaiser finds out its 32-inch diameter, 70-inch long ingots will successfully press forge. On page 138 you'll find a description of the process which allows these ingots to successfully pass the forge test as described by two company authorities.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

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Market Outlook

STEEL INGOT production reached its highest level since February. It touched 73 per cent of capacity in the week ended yesterday after climbing 2 points over the preceding week.

The 73-per-cent level is only 2.5 points below the year's high mark recorded in January.

WHAT THEY THINK— Some people think the ingot rate is about as high as it will go for a while. They think it will turn down during the summer vacation period and then recover, perhaps, in the fall. On the other hand, some people who have been rather pessimistic about the steel business are exhibiting some optimism; they think there'll be a gradual upswing in the second half. The second half starts only two and one-half weeks from now.

TOO LATE TO HEDGE— Expectations of a strengthening in the steel business aren't predicated on protective buying against a steelworkers' strike. It's too late to hedge against a strike. A strike can come at the end of the next two weeks. However, most of the bets are still against a strike.

SITTING TIGHT— Steel users haven't even shown an interest in trying to beat a price rise that might stem from a new wage contract for the steelworkers. Users look at it this way: A small increase in steel prices won't matter much. Effects of such an increase might be counteracted by price concessions the steel producers are making, such as waiving of extras and absorbing of freight charges.

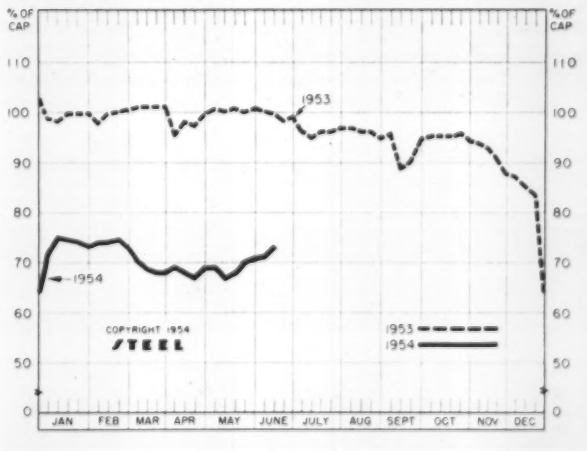
PRICES CUT— Competition for steel business might even prevent, or at least minimize, price increases. Evidences of the keenness of competition are the price reductions made last week on structural shapes and plate by two of Barium Steel Corp.'s subsidiaries. Phoenix Iron & Steel Co., Phoenixville, Pa., cut the base price of standard shapes and wide flange sections $7 a net ton. Old price, which was in line with that of most other producers, was 4.15 cents a pound; new price is 3.80 cents, considerably below the price of other producers. Central Iron & Steel Co., Harrisburg, Pa., lowered the base price of its plain carbon plates $5 a net ton. Its old price, which was as low as that quoted by any other producer, was 4.10 cents a pound; new price is 3.85 cents, much below the rest of the market.

Those two downward price revisions lowered STEEL's finished steel price composite to $113.20 a net ton, a reduction of 50 cents.

MAINSTAY— The price reductions in structurals and plates came despite the fact that they, particularly structurals, have been in strong demand for construction purposes. In fact, construction and contractors' products are more than ever a mainstay of the steel industry. The American Iron & Steel Institute reports that those market groups received about as much steel (3 million tons) in the first quarter of this year as in the corresponding period of last year. Their percentage of total shipments was higher than at any time since 1940.

SCRAP RETREATS— Fluctuations continue to mark the steelmaking scrap market. STEEL's price composite returned to $28.17 a gross ton after a one-week stand at $28.50. With the scrap market dull, export markets are sought. From the East, scrap is moving to Yugoslavia.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended June 13	Change	Same Week 1953	Same Week 1952
Pittsburgh	70	+ 3*	97.5	2
Chicago	82.5	— 1	105	7.5
Mid-Atlantic	57	— 1	98	19
Youngstown	69	0	105	0
Wheeling	88.5	+19	100	51.5
Cleveland	71.5	+ 4*	98.5	0
Buffalo	67.5	0	106.5	0
Birmingham	78.5	+ 7.5	101	0.5
New England	52	0	95	25
Cincinnati	69.5	+ 2	95	58.5
St. Louis	72.5	+ 8	82.5	38.5
Detroit	76.5	+ 4	110	32
Western	85	+ 5	111	33
National Rate	73	+ 2	99.5	13

INGOT PRODUCTION‡

	Week Ended June 13	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	108.3†	104.2	105.2	167.5
NET TONS (In thousands)	1,740†	1,674	1,690	2,208

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended June 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.575	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.963	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.900	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.974	Pipe line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	10.975	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.755	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.506	Sheets, C.R., carbon	5.696	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.965	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.229				

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	June 8 1954	June 1 1954	Month Ago	May Average
(1947-1949=100)	140.9	140.9	140.8	140.8

STEEL's FINISHED STEEL PRICE INDEX*

	June 9 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.75	189.75	189.74	182.82	152.90
Index in cents per lb	5.140	5.140	5.140	4.953	4.142

STEEL's ARITHMETICAL PRICE COMPOSITES

	June 9 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.20	$113.70	$113.70	$111.28	$92.09
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.07
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.27
Steelmaking Scrap, GT	28.17	28.50	27.67	39.50	21.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	June 9 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	4.405	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.40
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.50
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.40
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.50
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.25
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.25
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75

SEMIFINISHED STEEL					
Billets, forging, Pitts (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	June 9 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	49.39
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, del. Phila.	60.16	60.16	60.16	59.75	49.89
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	39.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	45.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including brokers commission)					
No. 1 Heavy Melt, Pitts.	$29.50	$30.50	$29.50	$39.50	$23.00
No. 1 Heavy Melt, E. Pa.	23.00	23.00	23.00	41.50	20.00
No. 1 Heavy Melt, Chicago	32.00	32.00	30.50	37.50	21.50
No. 2 Heavy Melt, Valley	29.50	29.50	29.50	41.50	22.00
No. 1 Heavy Melt, Cleve.	28.50	28.50	28.50	39.00	18.50
No. 1 Heavy Melt, Buffalo	26.50	26.50	25.50	40.75	21.25
Rails, Rerolling, Chicago	44.50	44.00	42.00	47.50	27.75
No. 1 Cast, Chicago	38.50	38.50	38.50	38.00	27.50

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.00
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	16.25
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 13, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 27.00-27.50 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.05, chemical 14.15, corroding 14.15, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $265-$270, nom., per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices

DAILY NONFERROUS PRICE RECORD

	Price June 9	Last Change	Previous Price	May Avg.	Apr. Avg.	June 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	29.955	29.875
Lead	14.05	June 2	13.80	13.800	13.710	13.213
Zinc	11.00	June 3	10.50	10.290	10.250	11.000
Tin	93.75	June 9	93.50	93.600	96.260	92.918
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 93.75; prompt, 93.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max.) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.65 per lb f.o.b. shipping point; less than 1000 lb $4.80; 99+% hydrogen reduced, $4.95. Treated ingots $6.70.

Zinc: Prime Western 11.00, brass special 11.25, intermediate 11.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.35, special high grade 12.50, die casting alloy ingot 15.00, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingots: Piston Alloy 19.00-20.00; No. 12 foundry alloy (No. 2 grade) 18.75-19.25; 5% silicon alloy, 0.60 Cu max., 20.00-23.00; 13 alloy, 0.60 Cu max., 22.25-23.25; 195 alloy 21.00-21.50; 108 alloy 19.25-20.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.00-20.50; grade 2, 18.50-19.00; grade 3, 17.75-18.25; grade 4, 16.50-17.50.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze No. 225, 39.00; No. 245, 33.25; high-leaded tin bronze, No. 305, 31.50; No. 1 yellow, No. 405, 23.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.68; rod, bar and wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $19.00 per cwt; pipe, full coils $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 19.50-20.50; plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

	NICKEL, "A" Nickel	MONEL, Monel	INCONEL, Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 13.00; low copper clippings 13.00; mixed clippings 11.00; old sheet 10.00; borings and turnings 6.50; pistons and struts 7.50; crankcases 10.00; industrial castings 10.00.

Copper and Brass: Heavy copper and wire, No. 1 24.50-25.00; No. 2 copper 23.00-23.50; light copper 21.00-21.50; No. 1 composition red brass 18.50-19.00; No. 1 composition turnings 17.75-18.25; mixed brass turnings 13.00; new brass clippings 18.00; No. 1 brass rod turnings 13.75-14.25; light brass 12.00; heavy yellow brass 13.75-14.25; new brass rod ends 15.25; auto radiators, unsweated 15.00; cocks and faucets 16.00-16.50; brass pipe 17.00.

Lead: Heavy 10.75-11.25; battery plate 5.75-6.25; linotype and stereotype 13.00; electrotype 11.25; mixed babbitt 12.75.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 45.00-50.00.

Zinc: Old zinc, 4.75; new die cast scrap, 4.25; old die cast scrap, 2.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 14.50-15.00; 51S, 52S clippings 14.50-15.00; 14S, 17S, 24S clippings 13.00-13.50; mixed clippings 12.50-13.50; old sheet 11.50-12.50; old cast 11.50-12.50; clean old cable, free of steel 14.50-15.00; borings and turnings 12.00-13.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 27.00-27.25; No. 2 copper 25.50-25.75; light copper 24.00-24.25; refinery brass (60% copper) per dry copper content 22.50; auto radiators, 17.00-17.25.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass, No. 1 copper 27.00-27.25; No. 2 copper 25.50-25.75; light copper 24.00-24.25; No. 1 composition borings 20.50; No. 1 composition solids 21.50; heavy yellow brass solids 16.50; yellow brass turnings 16.00; radiators 17.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized; less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.125; 200-499 lb $1.11; 500-999 lb $1.106; 1000 lb or more $1.10.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 71.5; 100-600 lb 57.2; 700-1900 lb 54.7; 2000-9900 lb 53; 10,000 lb or more 51.9.

Stannous Chloride (Anhydrous): Less than 50 lb $1.576; 50 lb $1.236; 100-300 lb $1.086; 400-900 lb $1.061; 1000-1900 lb $1.037; 200-4900 lb $1; 5000-19,000 lb 93.9; 20,000 lb and over 87.8.

Stannous Sulphate: Less than 5 lb $1.276; 50 lb 97.5; 100-1900 lb 95.5; 2000 lb and over 93.5.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Birthmarking of metals merely marks time. Closest to agreement with the government on such a plan is the aluminum industry

BIRTHMARKING of metals—the armed services plan for mandatory mill marking of steel, aluminum and copper-brass products—is still in limbo after more than six months of study by industry.

Closest to agreement with the government is the aluminum industry. The proposal for steel is still being studied by a joint industry-government committee. Copper and copper alloy producers unofficially say they've studied the plan seriously and think it impracticable.

Its Purpose — The birthmarking proposal is wider in scope than many in industry realize, covering not only rolled products, but drawn, extruded and cast metals. Producers of these products would be required to use standard identification (symbols, industry designations and government specifications) on individual products as well as on bundles. The armed services say such a system would permit ready identification of inventories, facilitate sorting of stock in case of bombing and aid in salvaging scrap.

"Physical item marking on metals," says the revised government standard, "shall be such that it will not rub off or be smeared by contact incident to normal handling, weathering, shipment and storage. Tags used shall be of metal embossed type." (Industry thinks ink-marked cloth tags on bundles would be satisfactory.) "Legibility shall be such as required for readability and permanent identification." Here are the marking requirements for specific products:

Bars—One-half inch or more in width of flat or half-inch or more in diameter must be marked "in constantly recurring symbols at intervals not greater than three feet throughout length of bar." All smaller sizes must be bundled and tagged at each end, with a third tag placed near the middle inside the bundle.

Castings, Ingots, Pigs, Slabs and Billets—Identification must be cast integral with, stamped or otherwise permanently marked.

Extrusions and Shaped Tubing—On all in constantly recurring symbols not greater than three feet throughout tubing. All sizes too small for marking must be bundled and packed with tags at each end and one near the middle on the inside.

Plates, Sheet, Strip and Flat Products—Marked in rows of constantly recurring symbols from one inch to the opposite edge so no piece larger than 12 inches square shall be cut without bearing the information.

Tubular Products and Coiled Tubing—Printed on all tubular products every three feet throughout length of product, except on small sizes, which must bear the usual three tags.

Wire—Each spool marked at ends, and each coil or bundle of straightened and cut wire tagged.

The Air Force has been particularly active in pressing for mill marking (see STEEL, Apr. 12, p. 49), and industry has been forced to birthmark when supplying Air Force material. Lately other services have been whooping up the mill-marking system, while industry is loathe to go along.

Conflicts—Industry's objections to the plan are both technical and economic. Steel men feel it's an intricate problem with many intricacies that must be worked out. Copper alloy producers with their garden variety of 40-odd metals plus a myraid of alloys say they would need an almost infinite number of markings.

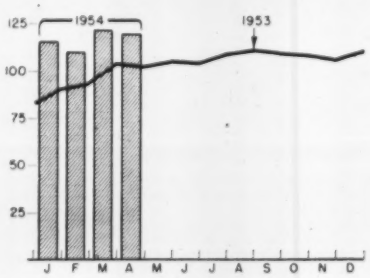
The plan for aluminum is still under consideration, but areas of disagreement aren't nearly as large as in copper and steel. As it's a relatively new industry, government has concentrated on indoctrinating it with using marking systems as normal. Thus it has always pretty much conformed to many of the military's proposals.

Stalemate—Mills would require a substantial investment in marking equipment to service a small portion of their business, and production delays would be more numerous, say industry men. One pictures a situation in which emergency production could be strangled by additional red tape. Outlook is for a continued stalemate in copper-brass and steel, even when agreement is reached with aluminum, though the military will undoubtedly use that as a wedge to bring all metals into the fold.

1954 BEATS 1953

Primary Aluminum Production in U. S.

(Thousands of net tons)



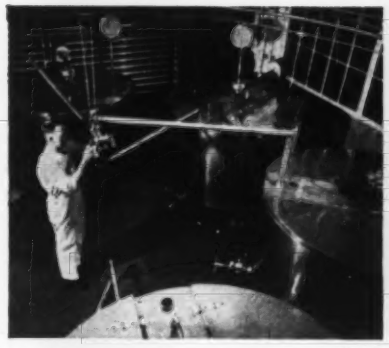
Source: U. S. Bureau of Mines.

Aiming for Price Boosts

Sure that government stockpiling will lift the burden of unwieldly inventories from their backs, lead and zinc men are wasting no time in plumping for higher prices. When confirmation of purchase authorizations by ODM came last week, lead was already at its highest point in 17 months, zinc at a nine-month peak. GSA will contract for the two metals through this month, when new directives will be issued. The move, now considered by some market insiders as an alternative to following tariff commission recommendations for stiff tariff increases, finds zinc producers with highest stocks in seven and a half years, lead men in better shape. Orders for both metals have been exceptionally strong in recent weeks. This factor coupled with the government rescue plan for the industry spells higher prices ahead for both metals.

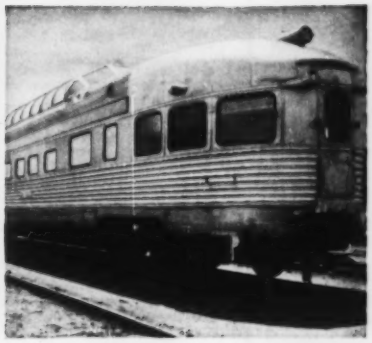
Market Memos

- Standard temper designations for magnesium products are expected to be announced this week. In general they parallel those of aluminum.
- Third-round aluminum expansion, long a dead duck, was officially buried by the government, with an explanation that aircraft requirements will be less than expected.
- May zinc statistics were highly disappointing, with stocks up 9000 tons to 209,828 tons and shipments down over 5000 tons from April.



The latest processing and production equipment for the food, chemical and petroleum industries is made of stainless steel. Practically unaffected by the corrosive action to which it is constantly subjected, this new equipment helps keep production costs down, greatly facilitates quality control.

Automotive applications for stainless steels become more numerous with each year's new-model cars and trucks. Today they include such diverse items as exhaust valves and door handles, water pump shafts and radiator grilles, decorative trim and truck bodies.



Lighter, more durable railroad cars are made possible by structural members and side paneling of strong, corrosion-resistant stainless steel. In both freight and passenger service, these cars are cutting railroad operating and maintenance costs, increasing the speed, safety and comfort of rail travel.

Why so many are saying...

MAKE IT STAINLESS

Manufacturers of everything from can openers and hub caps to railroad cars and jet engines are now saying, more and more frequently, "*make it stainless.*"

Virtually indestructible by corrosive action, stainless steels defy the effects of air, water, foods, fumes and chemicals. They can be machined, formed and fabricated; their surfaces can be polished satin-smooth or mirror-bright. There are grades of stainless available to meet a wide range of mechanical and heat-resistant requirements.

Stainless steels are cutting production costs, improving product performance and appearance, increasing customer acceptance in an ever-growing number of applications. For complete information in regard to your own application, contact your supplier.

The finest stainless steels are made with Vancoram ferrochromium, ferrochrome-silicon and ferro titanium.

Architectural components of stainless steel range from screws, nails and decorative trim to roofing, curtain walls and theater marquees. Strong and corrosion resistant, they cut construction and maintenance costs, yet increase beauty and efficiency, in all types of modern buildings.

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.

DETROIT · CHICAGO · PITTSBURGH · CLEVELAND

Producers of Alloys — VANCORAM — Metals and Chemicals

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 161. Key to footnotes, page 163.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana, Calif. K1 ....$86.00
Munhall, Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana, Calif. K1 ....88.00
Midland, Pa. C18 .....62.00
Munhall, Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa, Pa. J5 ....$62.00
Bessemer, Pa. U5 .....62.00
Clairton, Pa. U5 .....62.00
Ensley, Ala. T2 .....62.00
Fairfield, Ala. T2 .....62.00
Fontana, Calif. K1 ....70.00
Gary, Ind. U5 .....62.00
Johnstown, Pa. B2 ....62.00
Lackawanna, N.Y. B2 ..62.00
Munhall, Pa. U5 .....62.00
So. Chicago, Ill. U5 ...62.00
So. Duquesne, Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa, Pa. J5 ....$75.50
Bessemer, Pa. U5 .....75.50
Buffalo R2 .....75.50
Clairton, Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken, Pa. A3 ..80.50
Detroit R7 .....78.50
Ensley, Ala. T2 .....75.50
Fairfield, Ala. T2 .....75.50
Fontana, Calif. K1 ....83.50
Gary, Ind. U5 .....75.50
Geneva, Utah C11 ....75.50
Houston S5 .....83.50
Johnstown, Pa. B2 ....75.50
Lackawanna, N.Y. B2..75.50
Los Angeles B3 .....85.00
Munhall, Pa. U5 .....75.50
Seattle B3 .....89.00
So. Chicago R2, U5, W14..75.50
So. Duquesne, Pa. U5 ..75.50
So. San Francisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem, Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton, O. R2, T7 ....82.00
Conshohocken, Pa. A3..89.00
Detroit R7 .....84.00
Fontana, Calif. K1 ....101.00
Gary, Ind. U5 .....82.00
Houston S5 .....90.00
Ind. Harbor, Ind. Y1 ...82.00
Johnstown, Pa. B2 ....82.00
Lackawanna, N.Y. B2 ..82.00
Los Angeles B3 .....102.00
Massillon, O. R2 .....82.00
Midland, Pa. C18 .....82.00
Munhall, Pa. U5 .....82.00
So. Chicago R2, U5, W14 .82.00
So. Duquesne, Pa. U5 ..82.00
Struthers, O. Y1 .....82.00
Warren, O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton, O. R2 .....92.50
Cleveland R2 .....92.50
Fontana, Calif. K1 ....113.50
Gary, Ind. U5 .....92.50
Massillon, O. R2 .....92.50
So. Chicago, Ill. R2 ....92.50
So. Duquesne, Pa. U5 ..92.50

SHEET BAR (NT)
Fontana, Calif. K1 ...$93.18

SKELP
Aliquippa, Pa. J5 .....3.85
Munhall, Pa. U5 .....3.75
Warren, O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
Alabama City, Ala. R2 ..4.525
Aliquippa, Pa. J5 .....4.525
Alton, Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora, Pa. A7 .....4.525
Fairfield, Ala. T2 .....4.525
Fontana, Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown, Pa. B2 ....4.525
Joliet, Ill. A7 .....4.525
Kansas City, Mo. S5 ....4.865
Kokomo, Ind. C16 .....4.625
Los Angeles B3 .....5.325
Minnequa, Colo. C10 ....4.775
Monessen, Pa. P7 .....4.525
No. Tonawanda, N.Y. B11 4.525
Pittsburg, Calif. C11 ..5.175
Portsmouth P12 .....4.525
Roebling, N.J. R5 ....4.625
So. Chicago, Ill. R2 ....4.525
Sparrows Point, Md. B2..4.625
Sterling, Ill. (1) N15 ...4.525
Struthers, O. Y1 .....4.525
Torrance, Calif. C11 ...5.325
Worcester, Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Stand. Shapes
Alabama City, Ala. R2 ...4.10
Aliquippa, Pa. J5 .....4.10
Bessemer, Ala. T2 .....4.10
Bethlehem, Pa. B2 .....4.15
Clairton, Pa. U5 .....4.10
Fairfield, Ala. T2 .....4.10
Fontana, Calif. K1 .....4.75
Gary, Ind. U5 .....4.10
Geneva, Utah C11 .....4.10
Houston S5 .....4.50
Ind. Harbor, Ind. I-2 ....4.10
Johnstown, Pa. B2 .....4.15
Kansas City, Mo. S5 ....4.70
Lackawanna, N.Y. B2 ...4.15
Los Angeles B3 .....4.80
Minnequa, Colo. C10 ....4.55
Munhall, Pa. U5 .....4.10
Niles, Calif. P1 .....4.80
Phoenixville, Pa. P4 ....3.80
Seattle B3 .....4.85
So. Chicago, Ill. U5, W14..4.10
So. San Francisco B3 ....4.75
Torrance, Calif. C11 ....4.80
Weirton, W.Va. W6 .....4.10

Wide Flange
Bethlehem, Pa. B2 .....4.15
Clairton, Pa. U5 .....4.10
Fontana, Calif. K1 .....5.10
Lackawanna, N.Y. B2 ...4.15
Munhall, Pa. U5 .....4.10
Phoenixville, Pa. P4 ....3.80
So. Chicago, Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton, Pa. U5 .....5.00
Fontana, Calif. K1 .....6.40
Gary, Ind. U5 .....5.00
Munhall, Pa. U5 .....5.00
So. Chicago, Ill. U5 ....5.00

H.S., L. A. Stand. Shapes
Aliquippa, Pa. J5 .....6.175
Bessemer, Ala. T2 .....6.175
Bethlehem, Pa. B2 ....6.20
Clairton, Pa. U5 .....6.175
Fairfield, Ala. T2 .....6.175
Fontana, Calif. K1 ....6.825
Gary, Ind. U5 .....6.175
Geneva, Utah C11 .....6.175
Ind. Harbor, Ind. I-2 ...6.175
Ind. Harbor, Ind. Y1 ...6.675
Johnstown, Pa. B2 .....6.20
Lackawanna, N.Y. B2 ...6.20
Los Angeles B3 .....6.85
Munhall, Pa. U5 .....6.175
Seattle B3 .....6.90
So. Chicago, Ill. U5, W14..6.175
So. San Francisco B3 ....6.80
Struthers, O. Y1 .....6.675

H.S., L. A. Wide Flange
Bethlehem, Pa. B2 .....6.20
Lackawanna, N.Y. B2 ...6.20
Munhall, Pa. U5 .....6.125
So. Chicago, Ill. U5 ....6.125

PILING

Bearing Piles
Munhall, Pa. U5 .....4.10
So. Chicago, Ill. U5 ....4.10

STEEL SHEET PILING
Ind. Harbor, Ind. I-2 ...4.925
Lackawanna, N.Y. B2 ...4.925
Munhall, Pa. U5 .....4.925
So. Chicago, Ill. U5 ....4.925

PLATES

PLATES, Carbon Steel
Alabama City, Ala. R2 ..4.10
Aliquippa, Pa. J5 .....4.10
Ashland, Ky. (15) A10 ..4.10
Bessemer, Ala. T2 .....4.10
Clairton, Pa. U5 .....4.10
Claymont, Del. C22 ....4.10
Cleveland J5, R2 .....4.10
Coatesville, Pa. L7 .....4.10
Conshohocken, Pa. A3 ..4.10
Ecorse, Mich. G5 .....4.25
Fairfield, Ala. T2 .....4.10
Fontana, Calif. (30) K1 .4.75
Gary, Ind. U5 .....4.10
Geneva, Utah C11 .....4.10
Granite City, Ill. G4 ....4.30
Harrisburg, Pa. C5 ....3.85
Houston S5 .....4.50
Ind. Harbor, Ind. I-2, Y1..4.10
Johnstown, Pa. B2 .....4.10
Lackawanna, N.Y. B2 ..4.10
Lone Star, Tex. L6 .....4.40
Minnequa, Colo. C10 ....4.95
Munhall, Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale, Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon, Pa. S3 .....4.10
So. Chicago, Ill. U5, W14..4.10
Sparrows Point, Md. B2 ..4.10
Steubenville, O. W10 ....4.10
Warren, O. R2 .....4.10
Weirton, W.Va. W6 ....4.10
Youngstown R2, U5, Y1..4.10

PLATES, Carbon Abras. Resist.
Fontana, Calif. K1 .....5.90
Geneva, Utah C11 .....5.25

PLATES, Wrought Iron
Economy, Pa. B14 .....9.30

PLATES, High-Strength Low-Alloy
Aliquippa, Pa. J5 .....6.25
Bessemer, Ala. T2 .....6.25
Clairton, Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken, Pa. A3 ..6.25
Ecorse, Mich. G5 .....6.40
Fairfield, Ala. T2 .....6.25
Fontana, Calif. (30) K1 ..6.95
Gary, Ind. U5 .....6.25
Geneva, Utah C11 .....6.25
Ind. Harbor, Ind. I-2 ...6.25
Ind. Harbor, Ind. Y1 ....6.75
Johnstown, Pa. B2 .....6.25
Lackawanna, N.Y. B2 ...6.25
Munhall, Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon, Pa. S3 .....6.25
So. Chicago, Ill. U5, W14..6.25
Sparrows Point, Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont, Del. C22 ....5.55
Coatesville, Pa. L7 .....5.55
Fontana, Calif. K1 .....6.60
Gary, Ind. U5 .....5.55
Johnstown, Pa. B2 .....5.55
Munhall, Pa. U5 .....5.55
Sharon, Pa. S3 .....5.55
So. Chicago, Ill. U5, W14..5.55
Sparrows Point, Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken, Pa. A3 ...5.15
Harrisburg, Pa. C5 ....5.15
Ind. Harbor, Ind. I-2 ....5.15
Munhall, Pa. U5 .....5.15
So. Chicago, Ill. U5 ....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland l.c.l. (15) A10..4.85
Cleveland c.l. R2 .....4.70
Warren, O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa, Pa. J5 .....4.15
Alton, Ill. L1 .....4.35
Atlanta, Ga. A11 .....4.35
Bessemer, Ala. T2 .....4.15
Birmingham, Ala. C15. ..4.15
Buffalo (31) R2 .....4.18
Chicago (31) R2 .....4.22
Clairton, Pa. U5 .....4.15
Cleveland (31) R2 .....4.21
Detroit R7 .....4.30
Ecorse, Mich. G5 .....4.30
Emeryville, Calif. J7 ....4.90
Fairfield, Ala. T2 .....4.15
Fairless, Pa. U5 .....4.30
Fontana, Calif. K1 .....4.85
Gary, Ind. U5 .....4.15
Gadsden, Ala. (31) R2 ...4.18
Houston S5 .....4.55
Ind. Harbor, Ind. I-2, Y1..4.15
Johnstown, Pa. B2 .....4.15
Kansas City, Mo. S5 ....4.75
Lackawanna, N.Y. B2 ...4.15
Los Angeles B3 .....4.85
Milton, Pa. M18 .....4.15
Minnequa, Colo. C10 ....4.60
Niles, Calif. P1 .....4.85
N. Tonawanda, N.Y. B11..4.15
Pittsburg, Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland, Oreg. O4 .....4.90
Seattle B3, N14, P23....4.90
So. Chicago U5, W14 ....4.15
So. Duquesne, Pa. U5 ....4.15
So. San Fran., Calif. B3 ..4.90
Sterling, Ill. (1) N15 ...4.15
Struthers, O. Y1 .....4.15
Torrance, Calif. C11 ....4.85
Weirton, W.Va. W6 .....4.15
Youngstown U5 .....4.15
Youngstown (31) R2 ....4.20

Bars, Hot-Rolled Alloy
Bethlehem Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton, O. R2, T7 ....4.875
Clairton, Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse, Mich. G5 .....5.025
Fairless, Pa. U5 .....5.025
Fontana, Calif. K1 ....5.925
Gary, Ind. U5 .....4.875
Houston S5 .....5.275
Ind. Harbor, Ind. I-2, Y1..4.875
Johnstown, Pa. B2 .....4.875
Kansas City, Mo. S5 ....5.475
Lackawanna, N.Y. B2 ...4.875
Los Angeles B3 .....5.925
Massillon, O. R2 .....4.875
Midland, Pa. C18 .....4.875
So. Chicago R2, U5, W14..4.875
So. Duquesne, Pa. U5 ...4.875
Struthers, O. Y1 .....4.875
Warren, O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa, Pa. J5 .....6.225
Bessemer, Ala. T2 .....6.225
Bethlehem, Pa. B2 .....6.225
Clairton, Pa. U5 .....6.225
Ecorse, Mich. G5 .....6.375
Fairfield, Ala. T2 .....6.225
Fontana, Calif. K1 ....7.475
Gary, Ind. U5 .....6.225
Ind. Harb., Ind. Y1 ....6.725
Ind. Harb., Ind. I-2 ....6.225
Johnstown, Pa. B2 .....6.225
Lackawanna, N.Y. B2 ...6.225
Los Angeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So. Chicago W14 .....6.225
So. Duquesne, Pa. U5 ...6.225
So. San Francisco B3 ...6.975
Struthers, O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R. CARBON
Bethlehem, Pa. B2 .....4.35

BAR SIZE ANGLES: S. Shapes
Aliquippa, Pa. J5 .....4.15
Atlanta A11 .....4.35
Niles, Calif. P1 .....4.85
San Francisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton, Pa. U5 .....5.00
Fontana, Calif. K1 ....5.925
Gary, Ind. U5 .....5.00
Houston S5 .....5.60
Kansas City S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge, Pa. W18 .....5.20
Beaver Falls, Pa. M12....5.20
Beaver Falls, Pa. R2 ....5.26
Buffalo B5 .....5.25
Camden, N.J. P13 .....5.65
Carnegie, Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 .....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora, Pa. A7 .....5.20
Elyria, O. W8 .....5.20
Franklin Park, Ill. N5 ..5.20
Gary, Ind. R2 .....5.27
Green Bay, Wis. F7 .....5.20
Hammond, Ind. L2, M13..5.20
Hartford, Conn. R2 .....5.70
Harvey, Ill. B5 .....5.20
Los Angeles R2 ....6.65-6.96
Los Angeles S30 .....6.65
Mansfield, Mass. B5 ....5.75
Massillon, O. R8 .....5.20
Massillon, O. R2 .....5.24
Monaca, Pa. S17 .....5.20
Newark, N.J. W18 .....5.65
New Castle, Pa. (17) B4 ..5.20
Pittsburgh J5 .....5.20
Plymouth, Mich. P5 ....5.45
Putnam, Conn. W18 .....5.75
Readville, Mass. C14 ....5.75
St. Louis, Mo. M5 .....5.50
So. Chicago, Ill. W14 ....5.20
Spring City, Pa. K3 .....5.65
Struthers, O. Y1 .....5.20
Waukegan, Ill. A7 .....5.20
Worcester, Mass. W19 ...6.10
Youngstown F3, Y1 .....5.20

BARS, Cold-Finished Alloy
(Turned and Ground)
Cumberland, Md. (5) C19..4.45

BARS, Cold-Finished Alloy
Ambridge, Pa. W18 ....6.325
Beaver Falls, Pa. M12 ..6.325
Bethlehem, Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden, N.J. P13 .....6.50
Canton, O. R2, T7 ....6.325
Carnegie, Pa. C12 ....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora, Pa. A7 .....6.325
Elyria, O. W8 .....6.325
Gary, Ind. R2 .....6.325
Hammond, Ind. L2, M13..6.325
Hartford, Conn. R2 ....6.775
Harvey, Ill. B5 .....6.325
Lackawanna, N.Y. B2 ..6.325
Mansfield, Mass. B5 ....6.775
Massillon, O. R2, R8 ..6.325
Midland, Pa. C18 .....6.325
Monaca, Pa. S17 .....6.325
Newark, N.J. W18 .....6.65
Plymouth, Mich. P5 ....6.525
So. Chicago, Ill. R2, W14..6.325
Spring City, Pa. K3 .....6.50
Struthers, O. Y1 .....6.325
Warren, O. C17 .....6.325
Waukegan, Ill. A7 .....6.325
Worcester, Mass. A7 ..6.625
Youngstown F3, Y1 ..6.325

BARS, Reinforcing (Fabricators)
Alabama City, Ala. R2 ..4.15
Atlanta A11 .....4.35
Birmingham, Ala. C15 ..4.15
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville, Calif. J7 ....4.90
Fairfield, Ala. T2 .....4.15
Fairless, Pa. U5 .....4.30
Fontana, Calif. K1 ....4.85
Gary, Ind. U5 .....4.15
Houston S5 .....4.55
Ind. Harbor, Ind. I-2, Y1..4.15
Johnstown, Pa. B2 .....4.15
Kansas City, Mo. S5 ....4.75
Lackawanna, N.Y. B2 ...4.15
Los Angeles B3 .....4.85
Milton, Pa. M18 .....4.15
Minnequa, Colo. C10 ....4.75
Niles, Calif. P1 .....4.85
Pittsburg, Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Sand Springs, Okla. S5 ..5.00
Seattle B3, N14, P23....4.90
So. Chicago, Ill. R2 .....4.15
So. Duquesne, Pa. U5 ...4.15
So. San Francisco B3 ....4.90
Sparrows Point, Md. B2 ..4.15
Sterling, Ill. (1) N15 ...4.15
Struthers, O. Y1 .....4.15
Torrance, Calif. C11 ....4.85
Youngstown R2, U5 .....4.15

BARS, Reinforcing
(Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
Kansas City S5 .....6.35
Los Angeles B3 .....5.80
Marion, O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3, P23 .....5.85
So. San Francisco B3 ....5.85
Sparrows Pt. ½-1" B2 ..5.55
Williamsport, Pa. S19 ...5.45

RAIL STEEL BARS
Avis, Pa. (3) J8 .....4.25
Chicago Hts. (3) C2, I-2..4.05
Chicago Hts. (4) C2, I-2..4.15
Ft. Worth, Tex. (26) T4 ..4.65
Franklin, Pa. (3) F5 .....4.05
Franklin, Pa. (4) F5 .....4.15
Marion, O. (3) P11 .....4.00
Moline, Ill. (3) R2 .....4.15
Tonawanda (3,4) B12 ....4.15
Williamsport, Pa. (3) S19..4.25
Williamsport, Pa. (4) S19..5.45

BARS, Wrought Iron
Economy, Pa. (S.R.) B14 10.40
Economy, Pa. (D.R.) B14 12.90
Economy (Staybolt) B14 13.20
McK. Rks. (S.R.) L5 ...10.40
McK. Rks. (D.R.) L5 ...14.00
McK. Rks. (Staybolt) L5..15.50

SHEETS

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
Alabama City, Ala. R2 ..3.925
Allenport, Pa. P7 .....3.925
Ashland, Ky. (8) A10 ...3.925
Cleveland J5, R2 .....3.925
Conshohocken, Pa. A3 ..3.975
Detroit M1 .....4.075
Ecorse, Mich. G5 .....4.075
Fairfield, Ala. T2 .....3.925
Fairless Pa. U5 .....3.975
Fontana, Calif. K1 .....4.70
Gary, Ind. U5 .....3.925
Geneva, Utah C11 .....4.025
Granite City, Ill. G4 ....4.125
Ind. Harbor, Ind. I-2, Y1..3.925
Irvin, Pa. U5 .....3.925

Kokomo,Ind. C16 ....4.025
Lackawanna,N.Y. B2 .3.925
Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 ....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ..3.925
SparrowsPoint,Md. B2.3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5, Y1 ...3.925

SHEETS H.R. (19 gage)
AlabamaCity,Ala. R2 .5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 ....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ....5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.05
Fairfield,Ala. T2 .....5.90
Fairless,Pa. U5 .....5.95
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ...5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ....5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 .....5.90
SparrowsPoint (36) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 .....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.825
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2, Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.375
Fairless,Pa. U5 .....7.275
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1..7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	..6.075	6.675
Fairfield T2	....6.075	6.325
Gary,Ind. U5	..6.075	6.325
Ind.Harbor I-2	..6.075	6.325
Irvin,Pa. U5	...6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFrry.,O. W10	6.075	...
Pitts.,Calif. C11	..6.825	....
SparrowsPt. B2	..6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	....6.575
Fairfield,Ala. T2	....6.325
MartinsFerry,O. W10	..6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky.(8) A10 ..5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 .....5.275
Gary,Ind. U5 .....5.275
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275
Kokomo,Ind. C16 ....5.375
MartinsFerry,O. W10...5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ...6.025
SparrowsPoint,Md. B2.5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ...6.275
Weirton,W.Va. W6 ....5.275

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky. (8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825
Kokomo,Ind. C16 .....5.925
Niles,O. N12 .....5.825

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 .....5.275
Middletown,O. A10 ....5.275

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ...7.20
Follansbee(23) F4 ....6.425
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 .....3.925
Birmingham C15 .....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.075
Ecorse,Mich. G5 .....4.075
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5 .4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ..4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3, P23 ..4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ..3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2..3.925
Torrance,Calif. C11 ....4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.80
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3, P23 ..6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 .....5.45
Baltimore T6 .....5.60
Bridgeport,Conn.(10)S15 5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.60
Detroit D2, M1 .....5.60
Detroit P20 .....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.60
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ...5.70
Ind.Harbor,Ind. I-2 ....5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ....5.45
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(32) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 ....5.45
Warren,O. B9, R2 ....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
Pawtucket,R.I.(11) N8..12.15
Pawtucket,R.I.(12) N8..12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ..12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.30
Ecorse,Mich. G5 .....8.30
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke,Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co. Inc.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Follak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg.Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
Baltimore T6	5.60	7.95	8.90	10.85	13.15
Bridgeport,Conn.(10) S15	5.45	7.85	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland,O. C7	...	8.00	8.60	10.55	12.85
Dearborn,Mich. D3	5.60	7.85	8.80	...	....
Detroit D2	5.65	7.85	8.80	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Indianapolis C8	...	7.80	8.60	10.55	....
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.90	10.85	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I.(12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.50	15.00	....
Buffalo W12	...	...	12.50	....	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.85	15.35	18.35

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric Motor		Dynamo
BeechBottom,W.Va. W10	...	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	...	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	7.85	8.15	8.75	9.75	....	....
Mansfield,O. E6	7.85	8.15	8.75	9.75	10.65	
Newport,Ky. N9	7.85	8.15	8.75	9.75	10.65	
Niles,O. N12	7.85	8.15	8.75	9.75	....	
Vandergrift,Pa. U5	...	8.15	8.75	9.75	10.65	
Warren,O. R2	7.85	8.15	8.75	9.75	....	
Zanesville,O. A10	...	8.15	8.75	9.75	10.65	

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric Motor		Dynamo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	...	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2	...	...	...	....	12.35‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	.5.525
Aliquippa,Pa. J5	.5.525
Alton,Ill. L1	.5.70
Atlanta A11	.5.725
Bartonville,Ill. K4	.5.625
Buffalo W12	.5.525
Chicago W13	.5.525
Cleveland A7, C20, R2	.5.525
Crawfordsville,Ind. M8	.5.625
Donora,Pa. A7	.5.525
Duluth,Minn. A7	.5.525
Fairfield,Ala. T2	.5.525
Fostoria,O. (24) S1	.5.75
Houston S5	.5.925
Jacksonville,Fla. M8	.6.05
Johnstown,Pa. B2	.5.525
Joliet,Ill. A7	.5.525
KansasCity,Mo. S5	.6.125
Kokomo,Ind. C16	.5.625
LosAngeles B3	.6.475
Minnequa,Colo. C10	.5.775
Monessen,Pa. P7	.5.525
No.Tonawanda B11	.5.525
Palmer,Mass. W12	.5.525
Pittsburg,Calif. C11	.6.475
Portsmouth,O. P12	.5.525
Rankin,Pa. A7	.5.525
So.Chicago,Ill. R2	.5.525
So.SanFrancisco C10	.6.475
SparrowsPoint,Md. B2	.5.625
Sterling,Ill.(1) N15	.5.525
Struthers,O. Y1	.5.525
Waukegan,Ill. A7	.5.525
Worcester,Mass. A7	.5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	.6.925
Alton,Ill. L1	.7.10
Bartonville,Ill. K4	.7.025
Buffalo W12	.6.925
Cleveland A7	.6.925
Donora,Pa. A7	.6.925
Duluth,Minn. A7	.6.925
Fostoria,O. S1	.6.925
Johnstown,Pa. B2	.6.925
LosAngeles B3	.7.875
Milbury,Mass.(12) N6	.7.225
Minnequa,Colo. C10	.7.175
Monessen,Pa. P7, P16	.6.925
Muncie,Ind. I-7	.7.125
Palmer,Mass. W12	.7.225
Pittsburg,Calif. C11	.7.875
Portsmouth,O. P12	.6.925
Roebling,N.J. R5	.7.225
So.Chicago,Ill. R2	.6.925
So.SanFran. C10	.7.875
SparrowsPt.,Md. B2	.7.025
Struthers,O. Y1	.6.925
Trenton,N.J. A7	.7.225
Waukegan,Ill. A7	.6.925
Worcester A7, J4	.7.225
Worcester T6, W12	.7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	.6.625
Alton,Ill. L1	.6.80
Buffalo W12	.6.625
Cleveland A7	.6.625
Donora,Pa. A7	.6.625
Duluth,Minn. A7	.6.625
Johnstown,Pa. B2	.6.625
LosAngeles B3	.7.575
Minnequa,Colo. C10	.6.80
Monessen,Pa. P7, P16	.6.625
NewHaven,Conn. A7	.6.925
Palmer,Mass. W12	.6.925
Pittsburg,Calif. C11	.7.575
Portsmouth,O. P12	.6.625
Roebling,N.J. R5	.6.925
So.Chicago,Ill. R2	.6.625
So.SanFrancisco C10	.7.575
SparrowsPoint,Md. B2	.6.725
Trenton,N.J. A7	.6.925
Waukegan,Ill. A7	.6.625
Worcester,Mass. A7	.6.925

WIRE, Fine & Weaving(8"Coils)	
Alton,Ill. L1	.10.75
Bartonville,Ill. K4	.10.65
Buffalo W12	.10.55
Chicago W13	.10.59
Cleveland A7	.10.55
Crawfordsville,Ind. M8	.10.65
Fostoria,O. S1	.10.55
Jacksonville,Fla. M8	.11.08
Johnstown,Pa. B2	.10.55
Kokomo,Ind. C16	.10.55
Minnequa,Colo. C10	.10.30
Monessen,Pa. P16	.10.55
Muncie,Ind. I-7	.10.75
Palmer,Mass. W12	.10.85
Roebling,N.J. R5	.10.85
So.SanFrancisco C10	.10.90
Waukegan,Ill. A7	.10.55
Worcester,Mass. A7,T6	.10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	.9.50
Buffalo W12	.9.50
Johnstown,Pa. B2	.9.50
Minnequa,Colo. C10	.9.625
Monessen,Pa. P16	.9.50
Muncie,Ind. I-7	.9.70
Portsmouth,O. D2	.9.50
Roebling,N.J. R5	.9.80
SparrowsPt.,Md. B2	.9.60

ROPE WIRE	(A)
Alton,Ill. L1	.9.45
Bartonville,Ill. K4	.9.35
Buffalo W12	.9.35
Fostoria,O. S1	.9.35
Johnstown,Pa. B2	.9.35
Monessen,Pa. P7, P16	.9.35
Muncie,Ind. I-7	.9.55
Palmer,Mass. W12	.9.65
Portsmouth,O. P12	.9.35
Roebling,N.J. R5	.9.65
SparrowsPt. B2	.9.45
Struthers,O. Y1	.9.35
Worcester J4, T6	.9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	.12.75
Bartonville,Ill. K4	.12.65
Monessen,Pa. P16	.12.55
Roebling,N.J. R5	.12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	.7.45
Baltimore T6	.7.75
Buffalo W12	.7.45
Cleveland A7	.7.45
Crawfordsville,Ind. M8	.7.55
Dover,O. G6	.7.45
Fostoria,O. S1	.7.45
Kokomo,Ind. C16	.7.55
FranklinPark,Ill. T6	.7.60
Massillon,O. R8	.7.45
Monessen,Pa. P7, P16	.7.45
Pawtkt.,R.I.(12) N8	.7.75
Trenton,N.J. R5	.7.75
Worcester A7, T6, W12	.7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	.6.675 7.075**
Aliquippa J5	.6.675 7.20*
Atlanta A11	.6.775 7.30
Bartonville(48)K4	6.775 7.30
Buffalo W12	.6.675 7.075†
Cleveland A7	.6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	.6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	.6.675 7.075†
Houston,Tex. S5	.7.075 7.475
Jacksonville,Fla.M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	.6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	.6.775 7.175†
LosAngeles B3	.7.625 ....
Minnequa C10	6.925 7.325**
MonessenP7(48)	.6.675 7.225
Palmer W12	.6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Portsmouth,O.P12	.6.675 ....
Rankin A7	....6.675 7.075†
So.Chi'go R2	.6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Steri'g(1)(48)N15	6.675 7.20
Struthers,O. Y1	.6.675 7.175
Worcester A7	....6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga. Col.	
Ala.City,Ala. R2	.140**
Ala.City, 17 ga. R2	.235**
Ala.City, 18 ga. R2	.245**
Aliq'ppa,Pa.9-14½ga.J5	143*
Atlanta A11	.145
Bartonville,Ill. K4	.145
Crawfordsville,Ind. M8	.145
Donora,Pa. A7	.140†
Duluth,Minn. A7	.140†
Fairfield,Ala. T2	.140†
Houston,Tex. S5	.148
Johnstown,Pa. B2	.143
Johnstown 17 ga., 6" B2	.234
Johnstown 4" B2	.237
Joliet,Ill. A7	.140†
KansasCity,Mo. S5	.152
Kokomo,Ind. C16	.142†
Minnequa,Colo. C10	.148**
Monessen,Pa. 9 ga. P7	.145
Pittsburg,Calif. C11	.163†
Rankin,Pa. A7	.140†
So.Chicago,Ill. R2	.140**
Sterling,Ill. (1) N15	.143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	.149
Atlanta A11	.151
Bartonville,Ill. K4	.151
Crawfordsville,Ind. M8	.151
Donora,Pa. A7	.149
Duluth,Minn. A7	.149
Fairfield,Ala. T2	.149
Joliet,Ill. A7	.149
KansasCity,Mo. S5	.161
Kokomo,Ind. C16	.151
Minnequa,Colo. C10	.154
Pittsburg,Calif. C11	.173
So.Chicago,Ill. R2	.149
So.SanFran.,Calif. C10	.173
SparrowsPoint,Md. B2	.151
Sterling,Ill.(1) N15	.149

WIRE, Barbed	Col.
AlabamaCity R2	.153**
Aliquippa J5	.150*
Atlanta A11	.158
Bartonville,Ill. K4	.158
Crawfordsville,Ind. M8	.158
Donora,Pa. A7	.153†
Duluth,Minn. A7	.153†
Fairfield,Ala. T2	.153†
Houston,Tex. S5	.161
Johnstown,Pa. B2	.156*
Joliet,Ill. A7	.153†
KansasCity,Mo. S5	.165
Kokomo,Ind. C16	.155†
Minnequa,Colo. C10	.159**
Monessen,Pa. P7	.157
Pittsburg,Calif. C11	.173†
Rankin,Pa. A7	.153†
So.Chicago,Ill. R2	.153**
S.SanFrancisco C10	.176**
SparrowsPoint,Md. B2	.158*
Sterling,Ill. (1) N15	.156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Galv. Stone	Stone
Ala.City R2	.12.50	14.05**
Aliquippa J5	.12.50	14.30*
Bartonville K4	.12.60	14.40
Buffalo W12	.12.50	....
Cleveland A7	.12.50	....
CrawfordsvilleM8	12.50	14.30
Fostoria,O. S1	.12.60	14.15
Johnstown B2	.12.50	14.35*
Kokomo C16	.12.60	14.15†
Minnequa C10	.12.75	14.45**
Palmer,Mas.W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	.12.60	14.45*
Sterling(1) N15	.12.50	14.30
Waukegan A7	.12.50	14.05†
Worcester A7	.12.80	....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	.131
Aliquippa,Pa. J5	.131
Atlanta A11	.133
Bartonville,Ill. K4	.133
Chicago,Ill. W13	.131
Cleveland A9	.137
Crawfordsville,Ind. M8	.133
Donora,Pa. A7	.131
Duluth,Minn. A7	.131
Fairfield,Ala. T2	.131
Galveston,Tex. D7	.139
Houston,Tex. S5	.139
Johnstown,Pa. B2	.131
Joliet,Ill. A7	.131
KansasCity,Mo. S5	.143
Kokomo,Ind. C16	.133
Minnequa,Colo. C10	.136
Monessen,Pa. P7	.131
Pittsburg,Calif. C11	.150
Rankin,Pa. A7	.131
So.Chicago,Ill. R2	.131
SparrowsPt.,Md. B2	.133
Sterling,Ill. (1) N15	.131
Worcester,Mass. A7	.137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	.133
Aliquippa,Pa. J5	.133
Atlanta A11	.135
Bartonville,Ill. K4	.135
Crawfordsville,Ind. M8	.135
Donora,Pa. A7	.133
Duluth,Minn. A7	.133
Fairfield,Ala. T2	.133
Johnstown,Pa. B2	.133
Joliet,Ill. A7	.133
Kokomo,Ind. C16	.135
Minnequa,Colo. C10	.138
Monessen,Pa. P7	.133
Pittsburg,Calif. C11	.152
Rankin,Pa. A7	.133
So.Chicago,Ill. R2	.133
SparrowsPt.,Md. B2	.135
Sterling,Ill. (1) N15	.133
Worcester,Mass. A7	.139

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2 I-2	.145
Duluth,Minn. A7 (49)	.145
Franklin,Pa. F5	.145
Johnstown,Pa. B2	.145
Marion,O. P11	.145
Minnequa,Colo. C10	.150
Moline,Ill. R2	.145
So.Chicago,Ill. R2	.145
Tonawanda,N.Y. B12	.145
Williamsport,Pa. S19	.148

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	....
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		8c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6	26.5	—1.75	19.5	+2.75	12.5	+6.25	....	..	....	..	....	....	....	....	....	....
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
Fontana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	list	19.50	+4.00	12.5	+9	....	..	....	..	....	....	....	....	....	....
Sharon, Pa. M6	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20	34.75	21
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.75	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.75	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	..	25.75	....	25.75	....
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21	36.75	21	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut length 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.02	18.44
1¼	13	....	22.53	18.12
1½	13	20.65	24.91	20.01
1¾	13	24.40	29.43	23.66
2	13	27.34	32.98	26.51
2¼	13	30.80	37.15	29.86
2¼	12	33.43	40.32	32.41
2½	12	36.82	44.41	35.70
2¾	12	39.87	48.09	38.66
3	12	42.52	51.28	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Toe All No. 2	Rails 60 lb Under
Bessemer, Pa. U5	4.325	4.225	4.275	5.20
Ensley, Ala. T2	4.325	4.225	....	5.20
Fairfield, Ala. T2	....	....	....	5.20
Gary, Ind. U5	4.325	4.225	4.275	....
Huntington, W.Va. W7	....	....	....	5.20
Indiana Harbor, Ind. I-2	4.325	4.225	4.275	....
Johnstown, Pa. B2	....	....	...(16)	5.20
Lackawanna, N.Y. B2	4.325	4.225	....	5.20
Minnequa, Colo. C10	4.325	4.225	....	5.70
Steelton, Pa. B2	4.325	4.225	....	....
Williamsport, Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield, Ala. T2	5.125
Gary, Ind. U5	5.125
Ind. Harbor, Ind. I-2	5.125
Lackawanna, N.Y. B2	5.125
Minnequa, Colo. C10	5.125
Pittsburg, Calif. C11	5.275
Seattle B3	5.275
Steelton, Pa. B2	5.125
Torrance, Calif. C11	5.275

TRACK BOLTS (20) Treated

Cleveland R2	11.00
KansasCity, Mo. S5	11.00
Lebanon, Pa. B2	11.00
Minnequa, Colo. C10	11.00
Pittsburgh O3, P14	11.00
Seattle, Wash. B3	11.50

JOINT BARS

Bessemer, Pa. U5	5.275
Fairfield, Ala. T2	5.275
Ind. Harbor, Ind. I-2	5.275
Joliet, Ill. U5	5.275
Lackawanna, N.Y. B2	5.275
Minnequa, Colo. C10	5.275
Steelton, Pa. B2	5.275

AXLES

Ind. Harbor, Ind. S13	6.50
Johnstown, Pa. B2	6.50

STANDARD TRACK SPIKES

Fairfield, Ala. T2	7.05
Ind. Harbor, Ind. I-2, Y1	7.05
KansasCity, Mo. S5	7.30
Lebanon, Pa. B2	7.05
Minnequa, Colo. C10	7.06
Pittsburgh J5	7.06
Seattle B3	7.55
So. Chicago, Ill. R2	7.06
Struthers, O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:
½-in. & smaller diam. 4
⅝-in. & ⅝-in. 5
¾-in. and larger 3
Longer than 6 in.: All diameters. +4
Lag bolts, all diams.:
6 in. and shorter 12
Over 6 in. long 8
Ribbed Necked Carriage 5
Blank 25
Plow 25
Step, Elevator, Tap and Sleigh Shoe 12
Tire Bolts List
Boiler & Fitting-Up Bolts 23

NUTS

H.P. and C.P., regular & heavy:
Square, all sizes 58
H.P., Hex, regular & heavy:
⅝" and smaller 58
⅞" to 1⅛", inclusive 60
1¼" to 1½", inclusive 62
1⅝" and larger 58
C.P. Hex regular & heavy:
All sizes 58
Hot Galv. Nuts (all types):
¾" and smaller 40
⅞" to 1½", inclusive 43
Finished Hex Nuts:
New standard, all sizes 58
Semifinished & Slotted Hex:
Regular and heavy, all sizes 58

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 34
1 in. and smaller diam. x over 6 in. 20

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller 34
¼ in. diam & larger 14
N.F. thread, all diams. 8

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish ..... 47.5 x 10
Plated finishes ..... 30 x 10

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:
⅝-in. & smaller 38
¾-in. through 1 in. 22
Longer than 6 in.:
⅝-in. and smaller 20
¾-in. through 1 in. 7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge Iron:	
98+% Fe, annealed	18.00
Unannealed	
Minus 100 mesh	14.50
Minus 35 mesh	10.50
Minus 20 mesh	10.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	11.25
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	23.00
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum: Atomized, 500 lb drums, frgt. allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	28.75-37.50†
Bronze, ¼-ton lots	50.00-60.00‡
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	54.00-56.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.00-49.00‡
Nickel-Silver, ¼-ton lots	46.75**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots	15.00-28.75‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium electrolytic 99.9% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Sn. **64% Cu, 18% Zn, 18% Sn.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 8.10c for cut lengths.
(48) 6.7 gage.
(49) T-post; deduct 2 cols for U post.

STAINLESS STEEL MILL PRICES

(Representative prices cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	49.00	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	53.25	55.50	59.00	62.75	62.75
316L	....	....	52.50	....	58.25	61.00	64.25	67.75	67.75
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	46.00	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	59.25	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	....	33.75	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co., Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.80	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	.....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; Copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	3.875
18.25	4.25	1	4.75	....	2.160-2.320
18	4	2	9	....	2.515
18	4	2	....	....	1.640
18	4	1	....	....	1.480
13.5	4	3	....	....	1.735
6.4	4.5	1.9	....	5	1.005-1.055
6	4	3	....	6	1.240
2	1.4	1.2	....	....	0.495
1.5	4	1	....	8.5	0.865-0.895

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.75	61.25	61.75	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	64.00
Troy,N.Y. R2	64.00

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038—to standards for Full Finished hexagon head cap screws—bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 90,000 p. s. i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength in accordance with SAE Grade 5. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel—bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength in accordance with SAE Grade 2. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

*

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications—hexagon head hard; polished if specified — threads soft to close tolerance—points machine turned; flat and chamfered.

*

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

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* SPECIALS furnished to BLUE PRINT SPECIFICATIONS

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WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia and Buffalo, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Baltimore	6.20	7.12	7.78	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.13	7.06	7.13	8.26
Buffalo	6.11	7.10	8.65	6.50	...	6.27	7.65	11.97	6.49	6.45	7.80
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42	...	6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati	6.30	7.11	8.00	6.66	...	6.52	7.60	11.85	6.93	6.62	7.71
Cleveland	6.18	7.12	8.25	6.58	...	6.34	7.40	11.74	6.79	6.50	7.63
Detroit	6.38	7.29	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.15	...	8.25	6.45	...	6.28	7.25[4]	....	6.46	6.33	7.46
Houston	7.15	7.60	9.23	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Los Angeles	7.25	9.00	8.85	7.55	11.20	7.15	9.10	12.90	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59	...	6.45	7.57	11.77	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.30	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.78	7.52	8.37	7.16	...	7.06	8.43[6]	11.99	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.00	...	7.00	8.50	....	7.00	7.00	7.85
Philadelphia	6.35	7.13	7.87	7.02	8.80	6.87	8.19[6]	11.74	6.67	6.63	7.65**
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.60	6.46	6.33	7.46**
Portland, Oreg.	7.60	8.45	9.05	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	...	8.67	7.10	...	7.05	8.20	....	7.10	6.85	8.20
St. Louis	6.48	7.42	8.25	6.72	...	6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.84	7.78	8.61	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	8.95	7.60	...	7.15	9.75	12.90	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.35	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[8]	14.10	7.25	7.35	9.40
Washington	6.71	7.65	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [2]—500 to 9999 lb; [4]—4000 lb and over; [6]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Warehouse Steel Sales Remain Spotty

Distributors do not expect any sudden spurt in demand because users display no intention of accumulating stocks. Competition from secondary and imported products is keen

Cleveland—Local warehouse operators describe current demand as spotty. Business appears to be running in spurts, good volume buying one day being followed by relatively poor volume the next. There is nothing in the way of hedge buying to indicate consumers anticipate a steel strike this summer.

Competition is keen among the warehouses, especially for going sheet and strip business. In general, prices are holding but some shading is reported in competition with low prices offered on secondary material.

Pittsburgh—Warehouses expect no sudden sales spurt, but many sellers report sales steady, at about the same level as last month. Use still exceeds sales and distributors expect a 10 per cent increase in demand during second half of the year.

New York — Alloys are moving slowly from warehouses, but shipments of stainless flat-rolled are relatively substantial. Standard carbon products are sluggish, total volume being lowest in years. Cold-rolled carbon sheets show price weakness at the secondary level, also semifabricated plates. Competition on the latter is sharp. Substantial ratio of volume is done on price basis with imported carbon steel selling well under domestic prices.

Philadelphia—Warehouse trading is slightly off. Unless steel labor negotiations develop into a serious strike threat, the chances are the trend in demand will continue downward, particularly toward end of the month when the vacation season starts.

Boston — Warehouse volume has slipped slightly accompanied by softening in prices on cold and hot-rolled carbon sheets. Demand for wasters is confusing the primary flat-rolled market. There is some upgrading of secondary products.

Slit tonnage is cutting into cold-rolled strip. Stainless and alloys are slow. Average individual warehouse order is small.

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.75	$4.75	$4.70	$5.03
Bar Size Angles	4.50	4.50	4.40	4.73
Structural Angles	4.50	4.50	4.40	4.73
I-Beams	4.50	4.50	4.40	4.73
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.75	6.75	6.75	7.08
Merchant Bars	6.75	4.75	4.70	5.03
Hot-Rolled Bands	4.90	4.90	4.85	5.18
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Follansbee Steel Corp., Pittsburgh, is establishing a new Wallingford, Conn. depot of its Metals Division. Initial stocks of cold and hot-rolled steel products, terne metal and sheet metal specialties will be available from the new depot beginning June 15.

Cincinnati—After improving steadily since February, warehouse activity has started leveling off. Structural demand seems most active.

Los Angeles—Although warehouse May order volume exceeded the April level by 5 per cent, the increased activity was insufficient to lower above-normal stocks.

Seattle — May volume was disappointing for some warehouses. One large distributor reported sales were 40 per cent under those in May a year ago. Plates and shapes are down in volume.

Chicago — Warehouse steel sales fluctuate little, strengthening the view of many observers that a plateau has been reached in consumption for the present.

Imported Steel Prices Rise

New York—Imported steel prices are tending upward. This is due to no particular improvement on this side, but rather to more active markets in steel producing countries abroad and in other sections of the world in which these countries have been building up trade.

In some western European countries, steel mill operations are now reported hovering around 100 per cent of capacity, with deliveries becoming more extended. Some "fear" buying because of the Indo-China crisis may be contributing to the activity in western Europe.

Since the first of this month prices on imported merchant bars, reinforcing bars and hot bands have advanced $4 a ton. Bar size angles, structural angles and I-beams, as quoted by western continental European countries, have been stepped up $2 a ton on the East Coast and $1 a ton at Gulf and West Coast ports. Barbed wire prices have been increased $3 a ton at East Coast and Gulf ports and even more substantially on the West Coast. Bright common wire nails, 8d, have been advanced $6 at all ports.

On certain of these products even higher prices may develop before end of this month, in the opinion of some importers.

Furring channel prices are showing strength, but there has been no recent advance, nor has there been any recent advance in sheets, plates, wire rods and seamless tubing.

Sheet Users Still Order Cautiously

Moderate pickup in sales reported at some points but forward covering is restricted. Consumers are shopping for bargains. Little inventory building indicated

Sheet and Strip Prices, Page 160 & 161

Cleveland—The slight quickening in demand for sheets and strip noted the past couple weeks continues. Separate orders are larger in some cases than they were a month or two back. In the main, however, consumers are ordering only for needs in sight, practically nothing in the way of strike-hedge volume being reported.

Generally, the mills do not anticipate much change in market conditions over the next month or so with the vacation season getting under way. Expectations are that on toward end of summer a good buying movement will develop with consumers' stocks so low active replacement will be necessary to support fourth quarter manufacturing schedules.

Except for freight absorption, mill prices on sheets and strip are firmly held. However, should a steel wage advance result from current labor negotiations in the industry it would not be surprising if it were passed along to consumers in the way of a price hike.

Boston — Carbon sheet and strip bookings for July are slow. Consumers are placing orders for shipment either just before or after vacation suspensions. Third quarter orders include galvanized sheets and silicon strip for August. Stainless is slow, two weeks delivery on most grades.

One leading supplier to the automotive industry has reduced releases for July by one-third. Flat-rolled buyers are shopping for bargains, both delivery and prices. Wasters and secondary material are confusing the market and there appears to be some upgrading. Purchasers are buying generally to meet operating needs only, placing little or no forward tonnage.

New York—Sheet sellers note further improvement in sales, with no little buying for July and August delivery—buying that in no way could be ascribed to protective covering against the possibility of a steel strike, although it could reflect some measure of growing concern over the international situation.

Philadelphia—Except for tin plate, which is seasonally active, sheets are moving the best of the major steel products. Encouraging to producers is a modest but definite betterment in

Bethlehem Blast Furnace Sets World's Record

Bethlehem, Pa.—Blast furnace "J", Bethlehem Steel Co.'s Sparrows Point, Md., plant, set a world's record in May with an output of 61,424 tons of pig iron, says E. G. Grace, chairman of the board.

During this period, the daily average was 1981 tons, with the highest single 24-hour output being recorded at 2174 tons, on May 29.

"J" furnace thus exceeds by nearly 5000 tons the former record held by blast furnace "H", at the same plant, which produced 56,569 tons of pig iron in October, 1952, a daily average of 1825 tons.

About two-thirds of the materials smelted in furnace "J" during the record-breaking month was high-grade iron ore from Bethlehem's mines in South America. The remainder was made up of miscellaneous ores. Only a very small amount of metallic scrap was used.

Furnace "J", which has a hearth diameter of 28 feet, was first lighted on July 24, 1953, and has been in continuous production since that time.

hot and cold-rolled grades. These are the tonnage items. Galvanized sheets are in relatively better demand, and certain specialties are moving well. Included among the latter are electrical and stainless sheets. Enameling stock is moving in good volume.

Pittsburgh — Cautious buying by auto and appliance manufacturers continues to dominate the market.

Cincinnati—Demand for hot-rolled sheets is steady here. The market for cold-rolled sheets is depressed.

Chicago — Orders for sheets for July shipment have not been placed as fast as they were for June. However, it is too early to tell whether this suggests some summer slackening in consumption.

St. Louis—Sheet orders improved in May, rising 8 to 9 per cent over April volume. Steelmakers report moderate, but general strengthening of demand.

Los Angeles—Eastern sheetmakers are offering large tonnages of prime sheets at secondary prices, providing keen competition to western producers.

Steel Bars . . .

Bar Prices, Page 160

Boston — Not more than 50 per cent of steel bar consumers are buying for third quarter. Most buyers are placing orders for July only. There has been little strike or price hedge buying.

New York—Hot-rolled carbon bar demand still lags, but there is a little more future buying than there has been. In cold-drawn carbon bars business is reasonably good—better relatively than in hot bars. Some of this cold drawn bar activity is ascribed to a spurt in government buying for shells.

Philadelphia—Hot-rolled carbon bars are moving a little better. Some of this may be ascribed to a slight stir in munitions demand and to hedging against a possible steel strike.

Pittsburgh—An increasing number of bar consumers are completing inventory adjustments. This contributes to a more optimistic feeling among barmakers.

Cleveland—Little, if any, strike-hedge buying of merchant bars is noted. Consumers continue to order largely against needs in sight with inventories still being worked off. This applies to hot-rolled carbon, cold-finished carbon and alloy bars, although some slight pickup in demand for cold-finished is reported by a number of sellers.

Cincinnati—Orders at warehouses for cold-drawn carbon bars are spotty due to excellent mill deliveries and acceptance of small orders by producers. Demand for hot-rolled carbon bars is holding up well.

Chicago—Bar buying has moved along better than most producers had expected. No segment of consumption stands out but farm equipment is maintaining the improved level it moved up to in first quarter.

Plates . . .

Plate Prices, Page 160

Philadelphia—Plate business continues restricted. Even now some mills can work in tonnage for rolling this month. Majority of producers expect a dull summer. Conshohocken, Pa. producer will suspend plate operations Aug. 1 at least three weeks for mass vacations and improvements to facilities.

Central Iron & Steel Co., Harrisburg, Pa., reduced prices on plain carbon plates from $4.10 to $3.85 per 100 pounds base, reduction of $5 per ton, but there are no indications other district mills will take similar action.

The Navy awarded two 10,000-ton ammunition carriers to the Bethlehem yard at Sparrows Point, Md.

Boston—Competition for weldment volume is sharpest in smaller welded structures, three tons and under. Inquiry for larger and heavier work is slower with backlogs small. Tank shops are also operating with lower backlogs for small units, although tank volume is expected to hold up well through this month.

Failure of railroads to release plate orders keeps open substantial plate capacity.

New York — Most eastern plate mills are able to accept tonnage for rolling this month, indicating continued lag in demand. Placing by the government of a sizable car order in this district, however, gives promise of more activity in that field than has appeared around here in some time.

Pittsburgh—Plate sales are good, except to railroad carbuilders. Some slackness has developed in light plate orders but the construction industries continue to require large amounts of heavy and wide plate.

Semifinished Steel . . .

Semifinished Prices, Page 160

Youngstown — District steel rate held unchanged last week at about 69 per cent of ingot capacity.

Sharon Steel Corp. took off two open hearths at its Roemer Works, operating only two units out of 14 at that plant. However, U. S. Steel Corp. added one open hearth to its active list and also added one turn on its bessemers.

Tin Plate . . .

Tin Plate Prices, Page 162

Pittsburgh—Tin mills are booked solidly through June and are taking orders for July delivery. Although books are not completely filled for that month, mills report orders coming in steadily.

Wire . . .

Wire Prices, Page 162

Boston — Wire orders for third quarter are light. Reduced finishing operations next month will tie in with irregular shipping schedules. Most users will not take in steel during the vacation period. There is slight indication some wire consumers are jittery as to possible production loss through a steel strike.

New York—Slight improvement in carbon steel wire is centered in more common grades of basic and some spring material. Fine wire specialties are inclined to lag, also heading wire in screw sizes.

Demand is largely for current production with needed requirements missing from inventory. Consumer stocks are now worked down.

Philadelphia—Wire business is spotty, especially among the manufacturing items. Roebling's facilities in the Trenton, N. J., area will suspend for mass vacations June 18, resuming July 6.

Tubular Goods . . .

Tubular Goods Prices, Page 163

Boston—Seamless pipe sales are holding relatively higher than butt-weld, both distributors and direct shipments. Utilities are buying more in lots up to 100 tons, while prospective gas line extensions, Maine, involve a large tonnage of 8 and 10-inch.

Merchant pipe prices are easier at secondary level. While some distributors are holding to list, 10 per cent off is frequent.

Pittsburgh — Producers of welded and seamless tubes are more optimistic about the sales outlook. Gradually improving trend is noted, much of it due to gains in buying by warehouses. As yet producers expect no general rise in sales until third quarter.

Los Angeles — With substantial quantities of available tubular goods assuring a buyer's market, pipe sales are down. Foreign quotations on other than Australian pipe are disturbing the market.

Seattle—Cast iron pipe demand is fair, small tonnages predominating.

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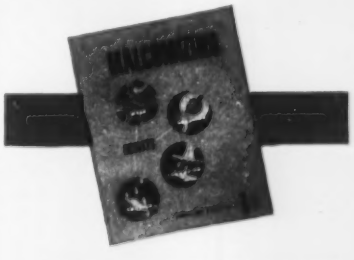

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Plants in

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Fillmore 4-4080

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GEnessee 5213

ST. LOUIS
650 E. Taylor
FIreside 6200

LOS ANGELES
2910 So. Sunal Drive
ANgelus 9-7311

LINDBERG STEEL TREATING CO.
1973 North Ruby Street, Melrose Park (Chicago) Illinois Phone: Fillmore 4-4080

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85% C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min carloads, 35c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, C.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, and 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6 per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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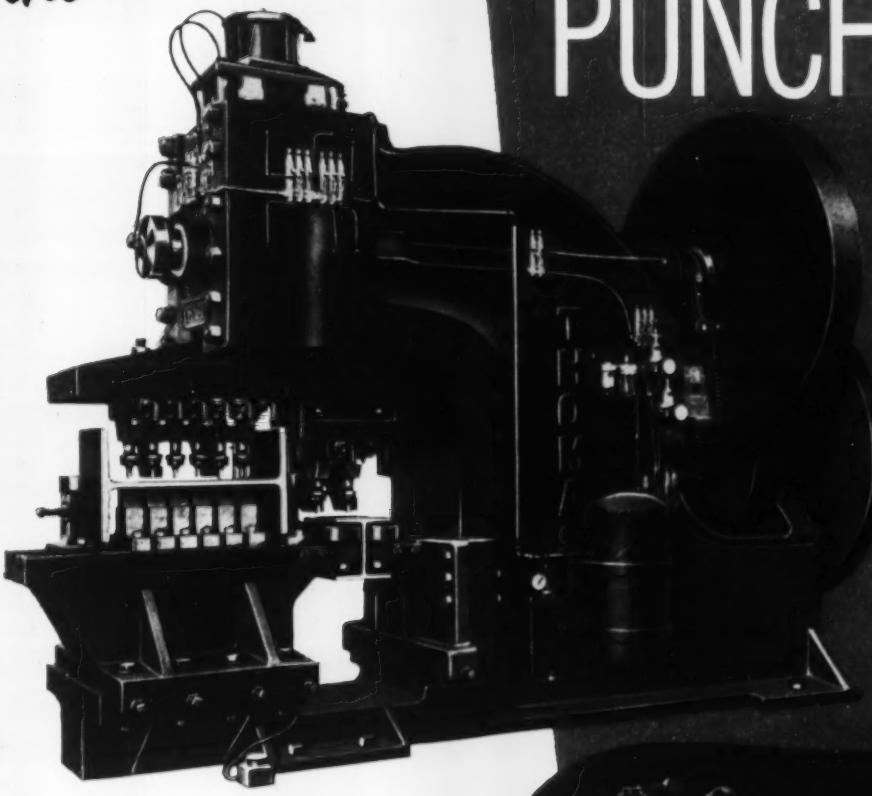
for the most modern in BEAM PUNCHES



Modern design and quality construction... these are the factors required to lower your punching costs. You'll find these advantages in the Thomas line of new Beam Punches... in models of from 100 to 400 ton capacities.

Multiple tool setups for flanges and webs permit continuous operation through a wide range of sizes without money-consuming delays for tool changes. Quality construction throughout provides insurance against costly down time!

Write for details!

The Thomas Beam Punch-Motorized Spacing Table combination produces the ultimate in production efficiency for the medium tonnage shop. With the Spacing Table, accurate hole spacing is assured without layout, and material handling is reduced to the bare minimum.

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Punches • Shears • Presses • Benders • Spacing Tables

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GRIND-O-FLEX

a new flexible grinding wheel

especially designed for finishing contours

GRIND-O-FLEX

is the only abrasive wheel

that:

- ★ Removes flash and parting lines on irregular shapes.
- ★ Gets in and around hard-to-reach areas.
- ★ Will not "flat" or dig into surfaces.
- ★ Hits selected areas to remove as much or as little stock as needed.
- ★ Finishes metals, plastics, stainless steel.
- ★ Requires no special equipment—attaches to your power tools.
- ★ Offers a wide range of grits for all types of finishing work.

GRIND-O-FLEX removes excess metal, smooths and polishes rough surfaces. It consists of hundreds of "leaves" of abrasive cloth sealed to a core. As the wheel spins it presents a continuous abrasive surface to the work piece. The leaves wear down evenly at a uniform rate, presenting a fresh abrasive contact at all times.

GRIND-O-FLEX is flexible and gets around intricate shapes and into recesses with ease. It can be used on selected, limited areas without "flatting," gouging or marring surfaces. No skill or previous experience is necessary. Absolutely safe.

GRIND-O-FLEX attaches to any rotating spindle (motor shaft, lathe, drill press, portable drill, flexible shaft, etc.)—no special equipment to buy. Wheel is 1" wide by 6½" diameter and comes in a wide range of grits. Arbors and flanges are furnished for mounting wheels to any shaft. Two or more wheels may be placed side by side on the same arbor to increase grinding surface if needed (see above). For more information and prices, see your abrasive dealer or write

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4023 Irving Place, Culver City, California

Manufacturers of SAND-O-FLEX and GRIND-O-FLEX abrasive tools

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If your product belongs in Metalworking

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ORES—COKE—REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit c.i.f. U. S. ports, duty for buyer's account; 46-47%, $0.95-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.60
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O. $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O. ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam. (Inches)	Length (Inches)	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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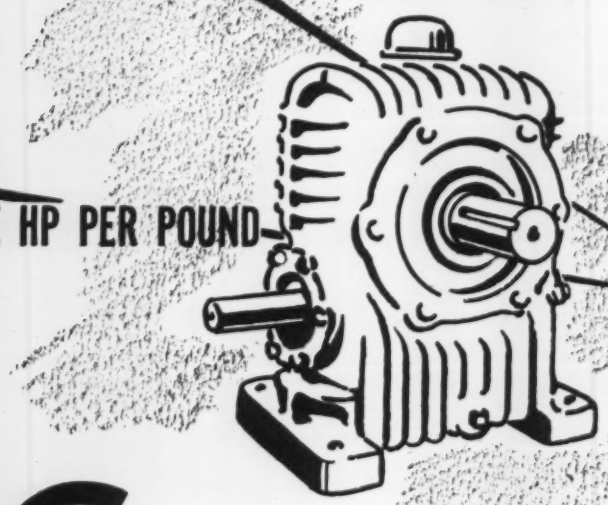

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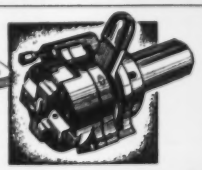

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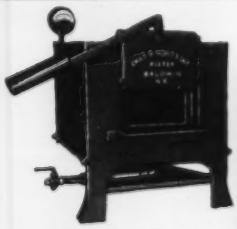

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Structural Shapes . . .

Structural Shape Prices, Page 160

Philadelphia—Structural awards are developing slowly, due more to prolonged negotiations by builders than to a lack of inquiry. Competition among fabricators is sharp. Builders, accordingly, are disposed to dicker at length to obtain lowest possible price.

Inquiries are fairly numerous and are accumulating in volume. Most fabricators have reasonably good backlogs.

Phoenix Iron & Steel Co., Phoenixville, Pa., has reduced prices $7 per ton on standard shapes and wide flange sections. In other words, this producer is now quoting $3.80 per 100 pounds base, against its previous quotation of $4.15.

Boston—Bookings of district fabricating shops are holding backlogs to three months or slightly better. While competition tends to keep pressure on fabricated prices, they are more stabilized.

First half volume in fabricated structural steel is slightly heavier than in the first six months of 1953.

New York—Bridge work is assuming greater dominance in the structural market, with an inquiry for a 6900-ton viaduct in Newark, N. J., outstanding. Demand in general is fairly good, however, although builders apparently are taking their time in closing.

Pittsburgh—Express highways continue to be one of the greatest volume users of structural shapes. On June 11 bids were opened on a major link of the Penn-Lincoln parkway.

Cleveland—Substantial volume of structural work is going ahead in this district and more is in prospect, chiefly consisting of public projects, churches and a scattering volume of industrial and commercial jobs. Competition is extremely keen and erected prices are weak. In one recent instance a successful bidder quoted $223 per ton erected against $240 to $250 by other bidders, and comparing with around $285 a year ago.

Whether a new wage agreement with the structural iron workers union, providing for a wage hike of 9 cents per hour, dues checkoff and payment for two holidays that fall on Saturday, will result in firming up the market is uncertain.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 173

Youngstown—Contract for a battery of 76 Wilputte underjet by-product coke ovens to be constructed at its Campbell Works has been placed by Youngstown Sheet & Tube Co. The facilities will have rated capacity of 1250 tons of coke daily, or about 450,000 tons a year. The ovens will be designed and constructed by Wilputte Coke Oven Division, Allied Chemical & Dye Corp.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 160

New York—The United States Steel Supply Division, U. S. Steel Corp., is moving its Reinforcing Bar Division from its present Newark, N. J., warehouse to 42-4 Lister Ave., that city. The new plant has an area of approximately 55,000 sq ft on a Central Railroad of New Jersey siding. Dock facilities on the Passaic river are available. Operations are expected to begin in August.

Seattle — Mill operations are unchanged. Large tonnages are lacking but small awards total considerable volume.

Stainless Steel . . .

Stainless Steel Prices, Page 164

New York—Production of stainless and heat resisting steel ingots increased in first quarter this year compared with last quarter of 1953, but fell far under production in first quarter of last year, according to the quarterly report of the American Iron & Steel Institute.

First quarter output this year totaled 187,111 net tons. This compares with 178,900 in last quarter of 1953, and with 303,843 in the first quarter of last year.

Pittsburgh—U. S. Steel Corp. published a complete book of extras June 1, incorporating all previous lists in convenient form. The booklet contains no changes from earlier extra charges.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, 14-story apartment, Tudor City area, between E. 41st and 42nd streets, New York, through Depot Construction Co. to Schacht Steel Construction Inc., New York.

715 tons, county courthouse annex, Worcester, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; S. Volpe & Co., Inc., Boston, general contractor.

500 tons, estimated, hangar, Hunter Air Force Base, Savannah, Ga., to Ingalls Iron Works, Birmingham; J. W. Bateson Co., Inc., Dallas, Tex., general contractor; reinforcing bars to Virginia Steel Products Co., Birmingham.

365 tons, research laboratory buildings, Monsanto Chemical Co., to Bethlehem Steel Co., Bethlehem, Pa., through Daniel O'Connell's Sons Co., Inc., Holyoke, Mass., general contractor.

220 tons, central heating plant, naval air

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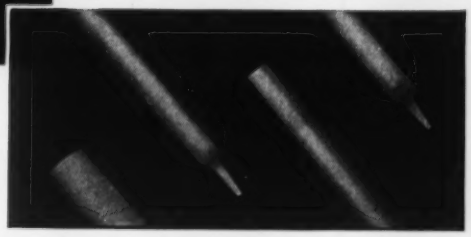

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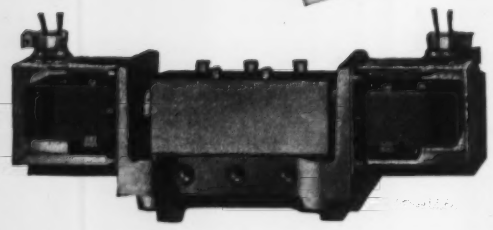

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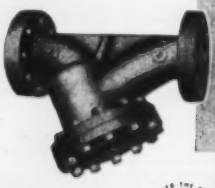

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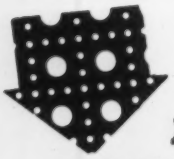

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station, Quonset Point, R. I., to Tower Iron Works, Providence, R. I.; D. C. Loveys Co., Cambridge, Mass., general contractor; reinforcing bars to United States Steel Supply Division, U. S. Steel Corp., Cambridge, Mass.

175 tons, building 64, General Electric Co., Lynn, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

155 tons, shop building, L. G. Balfour Mfg. Co., Attleboro, Mass., to Rumford Steel Products Co., Providence, R. I.

150 tons, bank building, Provident Institute of Savings, Boston, to A. O. Wilson Structural Co., Cambridge, Mass.; McCutcheon Co., Boston, general contractor.

145 tons, building, Gordon College, Wenham, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; George B. H. Macomber Co., Boston, general contractor.

140 tons, state bridge, Susquehanna county, Pa., to High-Welding Steel Co., Lancaster, Pa.

110 tons, Franklin elementary school, Carbon county, Pa., to Eastern Steel Structurals, Easton, Pa.

STRUCTURAL STEEL PENDING

6900 tons, viaduct, New Jersey Turnpike Authority, Newark, bids June 25.

3000 tons, Army hangars, Jacksonville, Ark., bids to be received by the Corps of Engineers, June 23.

1500 tons, Army hangar, Smyrna, Tenn., bids closed by the Corps of Engineers, June 10.

1065 tons, state office building, Augusta, Me.; Joseph Rugo Co., Boston, general contractor.

950 tons, state bridgework, Bucks county, Pa., bids June 25.

450 tons, maintenance hangar, Army Corps of Engineers, Topeka, Kan., bids June 23.

400 tons, two Army warehouses, Elmendorf Air Base, Alaska; L. E. Baldwin, Inc., Seattle, awarded general contract, $2,403,338.

350 tons, store, Sears, Roebuck & Co., Elmira, N. Y., bids June 15.

100 tons plus, 327 ft, 24 ft wide, I-beam bridges in Alaska; David Nygren, Seattle, recommended for award, $247,650, by Alaska Road Commission.

REINFORCING BARS . . .

REINFORCING BARS PLACED

415 tons, bridge piers, Maine turnpike extension, Portland-Augusta, contract 213, to Bancroft & Martin Rolling Mills Co., Portland, Me.; Savin Construction Co., East Hartford, Conn., general contractor.

340 tons, Physicians' building, Georgia Baptist Hospital, Atlanta, to Southern General Fireproofing Co., Atlanta; Mion Construction Co., Atlanta, general contractor; 90 tons, garage, to Hall Steel Co., Atlanta.

325 tons, bridge piers, Androscoggin river, Maine turnpike extension, Portland-Augusta, to Bancroft & Martin Rolling Mills Co., Portland; W. H. Hinman, Inc., North Anson, Me., general contractor; will also erect 1740 tons of structural steel fabricated by Phoenix Bridge Co., Phoenixville, Pa.

230 tons, Army warehouse, Elmendorf Air Base, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; L. E. Baldwin, Inc., Seattle, general contractor.

165 tons, research laboratory buildings, Monsanto Chemical Co., to Bethlehem Steel Co., Bethlehem, Pa., through Daniel O'Connell's Sons Co., Inc., Holyoke, Mass., general contractor.

130 tons, North Town Shopping Center, Spokane, to Bethlehem Pacific Coast Steel Corp., Seattle; Halvorson & Co., general contractor.

130 tons, bridge foundations, Maine turnpike extension, Portland-Augusta, to Bancroft & Martin Rolling Mills Co., Portland; Cianchette Bros., Inc., Pittsfield, Me., general contractor.

100 tons, National Bank of Commerce, branch bank, Seattle, to Jos. T. Ryerson & Son, Inc., Seattle.

REINFORCING BARS PENDING

550 tons, contract No. 55, section 1, Garden State parkway, Bergen county, New Jersey, bids June 24.

175 tons, Washington state road projects; bids to Olympia, Wash., June 22; also 71 tons, bids to Olympia June 8.

65 tons, also other metal items, bridge, Fremont county, Idaho; bids to Bureau of Public Roads, Boise, June 17.

PLATES . . .

PLATES PLACED

100 tons or more, 400,000-gal. steel reservoir, veterans' hospital, Lyons, N. J., to Hammond Iron Works, Warren, Pa.

PLATES PENDING

400 tons, 16 underground and two 15,000-barrel vertical tanks, airfield base, Bunker Hill, Ind.; bids June 18, Public Works Office, Navy, Great Lakes, Ill.

100 tons, 250,000-gal. welded elevated water tank replacement, Naval construction, Batnelview, Tex.; bids to Corps of Engineers, Galveston, Tex.

100 tons, five 50,000-gal. water tanks, Navajo Indian reservation; bids to Federal Center, Denver, Colo.

PIPE . . .

CAST IRON PIPE PLACED

237 tons, 12 to 6 inch system expansion, Pendleton, Oreg., to Pacific States Cast Iron Pipe Co., Provo, Utah.

97 tons, 9000 ft 8 and 4 inch for Cowlitz county PUD, Longview, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

CAST IRON PIPE PENDING

398 tons, previously reported unstated, 12 to 3 inch and accessories, Valdez, Alaska; general bids in.

251 tons, previously reported unstated, also steel reservoir; bids to Umatilla, Oreg., June 21.

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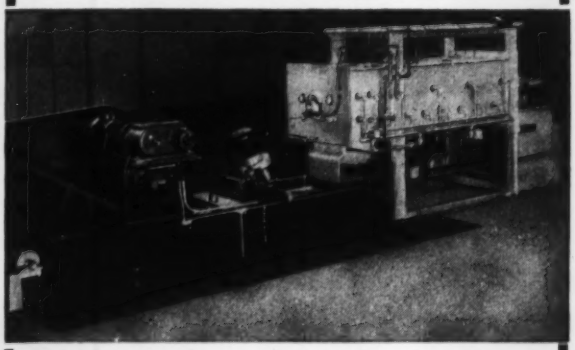

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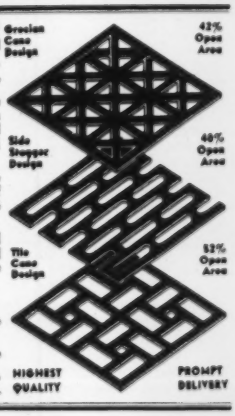

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Scrap Market Sentiment Appears Mixed

Prices still advancing at some consuming points but uptrend generally seems to be halted. Buying continues restricted and little pickup is expected in weeks immediately ahead

Scrap Prices, Page 180

Pittsburgh—A small purchase of scrap lowered prices of No. 1 and No. 2 heavy melting, No. 1 and No. 2 bundles and No. 1 busheling. No. 1 heavy melting dropped $1 to $29 to $30. Aside from this one sale to a mill which has not been in the market for several weeks, scrap shipments were slow.

New York—Brokers have reduced their buying prices on No. 2 bundles to a range of $12 to $13, on machine shop turnings to $4.50 to $5 and on unstripped motor blocks to a purely nominal range of $19 to $20. Offerings on all other grades are unchanged with little going on in any line.

The increasingly critical situation abroad has not imparted any particular strength to the market to date. This might be due primarily to the fact stocks generally are heavy, at dealers' yards as well as at consuming plants.

Meanwhile, scrap is being loaded here for shipment to Yugoslavia. It is reported two ships are taking on tonnage at this port, with more to be loaded at Norfolk, Va.

Stainless steel scrap prices are steady, with activity particularly in 18-8 sheets, clips and solids.

Boston — Except for top grade short shoveling turnings, steel scrap prices are slow to reflect a firmer trend. That grade is quoted $10 to $10.50, shipping point. New buying is slow, and while small shipments against old orders are being cleaned up, yard stocks are substantial.

Buffalo — Strength and fresh buying interest features the scrap market here. Dealers, however, refuse to accept new orders from mills at prevailing prices.

Philadelphia—Scrap demand is dull with prices generally unchanged in virtually all grades except for malleable which is off nominally to a range of $37 to $38 delivered.

Plan for shipping a cargo of steel from this port in June has been canceled. Instead, the scrap will be picked up at New York and Norfolk, Va., possibly amounting to 8000 tons or more. The scrap is destined for Yugoslavia.

Cleveland—Although scrap prices are unchanged market sentiment is again veering toward the weak side. Continued absence of active mill buying and approach of the vacation season serve to undermine confidence for the near-term.

Cincinnati — Scattered buying by Newport Steel Corp. has resulted in an increase of $2 a ton on No. 2 bundles and a general rise of $1 a ton on all other open-hearth grades. The No. 1 grades are now quoted $27 to $28. No. 2 heavy melting is $24 to $25, and No. 2 bundles, $22 to $23. All other scrap items are unchanged.

The market appears to be resting on a peak. There are no visible signs of weakness.

Chicago—The scrap market here is holding the strength achieved within the past two weeks. Moderate buying by steel mills, however, is arresting upward price adjustments for the moment.

Detroit—The upturn in the scrap market, which most observers seem to feel is somewhat temporary, continued last week. Occasioned by the possibility of a steel strike which has bolstered production, prevailing opinion here is that a gradual downturn will be experienced through the summer into early fall before a rise starts in the market again.

St. Louis—Scrap rails are active. Prices remain strong despite heavy offerings. In other grades demand is slack with the price undertone weak.

Los Angeles — Despite depressed mill demand, prices on steelmaking grades of scrap are firming. Trade

(*Please turn to page* 182)

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June 9	$28.17
June 2	28.50
May Avg.	28.00
June, 1953	40.50
June, 1949	20.85

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

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(Delivered consumer plant)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*29.00-30.00*
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals	30.00-31.00
Heavy turnings	*28.00-29.00*
Punchings & plate scrap	*32.00-33.00*
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	33.00-34.00
Heavy breakable cast	31.00-32.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt	32.00-33.00
Rails, 2-ft and under	43.00-44.00
Rails, 18-in. and under	45.00-46.00
Rails, random lengths	37.00-38.00
Railroad specialties	34.00-35.00

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	28.00-29.00
No. 2 bundles	21.00-22.00
No. 1 busheling	28.00-29.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	16.00-17.00
Short shovel turnings	16.00-17.00
Cast iron borings	16.00-17.00
Low phos.	26.00-27.00
Cut structural plate 2 ft and under	34.00-35.00
Alloy free, short shovel turnings	16.50-17.50
Electric furnace bundles	26.00-27.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	27.50-28.50
Stove plate	36.50-37.50
Heavy breakable cast	26.50-27.50
Unstripped motor blocks	25.50-26.50
Brake shoes	30.50-31.50
Clean auto cast	43.00-44.00
No. 1 wheels	33.50-34.50
Burnt cast	31.50-32.50
Drop broken machinery	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt	31.00-32.00
R.R. malleable	41.00-42.00
Rails, 3-ft. and under	44.00-45.00
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	40.00-41.00
Cast steel	34.00-35.00
Railroad specialties	35.00-36.00
Uncut tires	36.00-37.00
Angles, splice bars	42.50-43.50
Rails, rerolling	42.00-43.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids, nom.	160.00-170.00
18-8 turnings, nom.	70.00-80.00
430 clips, bundles, solids, nom.	70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	29.00-30.00
No. 2 bundles	22.00-23.00
Machine shop turnings	13.00-14.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Low phos.	30.00-31.00
Electric furnace bundles	29.00-30.00

Railroad Scrap

No. 1 R.R. heavy melt	31.00-32.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	23.00
No. 2 heavy melting	21.00
No. 1 bundles	24.00
No. 2 bundles	*nom.*
No. 1 busheling	23.00
Electric furnace bundles	25.00*
Machine shop turnings	14.00
Mixed borings, turnings	15.00
Short shovel turnings	17.00
Structurals & plate	29.00*
Heavy turnings	22.00
Couplers, springs, wheels	31.00
Rail crops, 2 ft & under	41.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	*37.00-38.00**
Heavy breakable cast	35.50
Unstripped motor blocks	*nom.*
Drop broken machinery	41.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	17.00-18.00
No. 2 heavy melting	15.00-16.00
No. 1 bundles	17.00-18.00
No. 2 bundles	*12.00-13.00*
Machine shop turnings	*4.50-5.00*
Mixed borings, short turnings	8.00-9.00
Low phos. (structural & plate)	21.00-22.00
Short shovel turnings	10.50-11.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	*19.00-20.00**

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	17.00
No. 2 heavy melting	15.25-16.00
No. 1 bundles	17.00
No. 2 bundles	13.25-14.25
Machine shop turnings	3.00-3.50
Mixed borings, turnings	5.50-6.00
Short shovel turnings	*10.00-10.50*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*27.00-28.00*
Machine shop turnings	11.00-12.00
Mixed borings, turnings	13.50-14.50
Short shovel turnings	13.50-14.50
Cast iron borings	13.50-14.50
Low phos., 18-in.	32.00-33.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	36.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R., heavy melt.	29.00-30.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	37.00-38.00

CHICAGO

No. 1 heavy melting	31.00-33.00
No. 2 heavy melting	29.00-30.00
No. 1 factory bundles	33.00-34.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	22.00-23.00
No. 1 busheling	31.00-33.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals, 3-ft	34.00-35.00
Punchings & plate scrap	34.00-35.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	32.00-34.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	40.00-42.00
Drop broken machinery	41.00-42.00

Railroad Scrap

No. 1 R.R., heavy melt	34.00-35.00
R.R. malleable	40.00-42.00
Rails, 2-ft. and under	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Angles, splice bars	38.00-39.00
Rails, rerolling	44.00-45.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*23.00*
No. 2 heavy melting	*20.00*
No. 1 bundles	*25.00*
No. 2 bundles	19.00
No. 1 busheling	*23.50*
Machine shop turnings	10.00
Mixed borings, turnings	10.00
Short shovel turnings	11.50
Punchings & plate scrap	*25.50*

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	27.00
Stove plate	29.00
Heavy breakable	26.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	26.00-27.00
No. 2 bundles	19.00-20.00
No. 1 busheling	26.00-27.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	17.50-18.00
Short shovel turnings	18.50-19.00
Cast iron borings	17.50-18.00
Low phos.	29.00-29.50

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	33.00-34.00
Rails, 3-ft and under	40.00-41.00
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	*21.50-24.50*
No. 2 heavy melting	22.00-23.00
No. 1 bundles	*18.00-19.00*
No. 2 bundles	*16.00-17.00*
Cast iron borings	13.00-14.00
Short shovel turnings	*16.00-17.00*
Machine shop turnings	*15.00-16.00*
Electric furnace bundles	25.00-26.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*43.50-44.50*
Stove plate	*40.50-41.50*
Bar crops and plate	29.00-30.00
Structural, plate 2 ft	29.00-30.00
Unstripped motor blocks	*35.00-36.00*

Railroad Scrap

No. 1 R.R. heavy melt	26.00-27.00
Rails, 18-in. and under	*40.00-41.00*
Rails, rerolling	*39.00-40.00*
Angles, splice bars	36.00-37.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	26.50
No. 2 heavy melting	24.50
No. 1 bundles	26.50
No. 2 bundles	20.25
Machine shop turnings	12.00
Short shovel turnings	14.00

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	29.00
Heavy breakable cast	29.00
Unstripped motor blocks	*29.00*
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	33.00

Railroad Scrap

No. 1 R.R. heavy melt	33.50
Rails, 18-in. and under	41.00
Rails, random lengths	38.00
Rails, rerolling	45.50
Uncut tires	32.50
Angles, splice bars	33.50

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	21.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	41.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	38.00-42.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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• "*a sound future built on sound money*": During 1953, sales of Series E and H Savings Bonds—22% higher than in 1952—provided cash for all maturities and redemptions of those series and still left more than $210,000,000, *net*.

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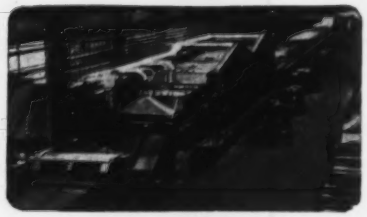

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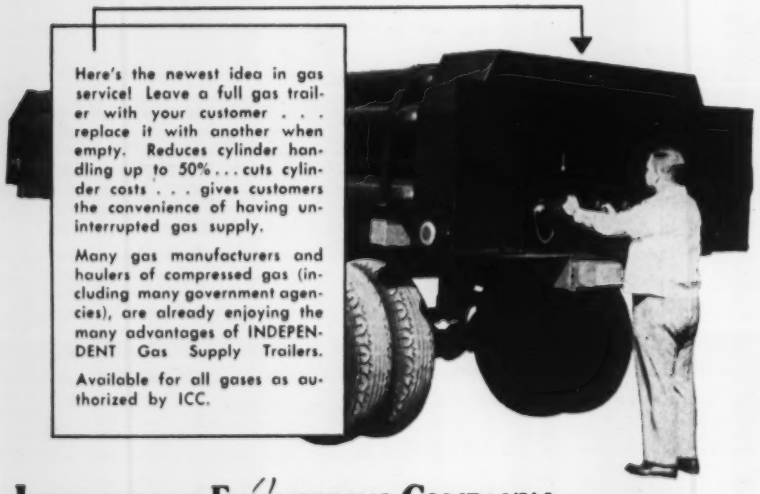

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(*Concluded from page* 179)

attributes the stronger tone to psychological factors arising from unsettled world conditions. No. 1 cupola cast is quoted from $38 to $42.

Seattle—There is little life in the scrap market. One cause for reduced buying is lowered mill production and smaller inventories held by larger consumers.

Iron Ore . . .

Iron Ore Prices, Page 173

Cleveland—Shipments of iron ore from upper lake ports continue to run far behind the movement of a year ago. In the week ended June 7 shipments amounted to 2,315,086 gross tons, reports the Lake Superior Iron Ore Association. This compares with shipments of 3,137,606 tons in the corresponding week of 1953.

Cumulative shipments of lake ore in the 1954 navigation season to date now stand at 13,540,203 tons, about 11,681,580 tons behind shipments of 25,221,785 tons recorded to June 7 in the 1953 navigation season.

Pig Iron . . .

Pig Iron Prices, Page 164

Cleveland—Merchant pig iron demand continues sluggish with foundry operations spotty. Little, if any, protective buying against interruption of shipments as result of a steel strike is in evidence here though some shops may be adding slightly to their limited inventories.

Pig iron production is restricted in this immediate district with only 6 out of 10 blast furnaces in operation. Last week Republic Steel Corp. reported a new monthly blast furnace production record was set at its Warren, O., plant. The furnace produced 53,743 tons, for an average daily output of 1734 tons. Its rated capacity is 1470 tons daily.

Boston—Shipments in June will be the lowest this year with the over-all melt off. It is not likely shipments will improve in July. Most jobbing foundries are operating on irregular schedules. Machine tool requirements are lower with one or two exceptions.

Philadelphia—Pig iron movement is down. Further decline is expected shortly as consumers close for a week or longer for mass vacations.

New York—With pig iron sellers receiving an increasing number of notices these days from their foundry customers of their intention to suspend operations for at least a week, if not longer, late in June and early in July, the trend in iron shipments is due for a further drop. Un-

less there is a very substantial and widespread increase in defense demands, the trade looks for a slow summer.

Cincinnati—Foundry business is spotty. There is little chance of an immediate general pick-up now that the vacation season is at hand.

Chicago—Foundry operations continue spotty. The view prevails here that more iron is being consumed than is being shipped.

St. Louis—Pig iron market is inert with foundry demand slack. Ground stocks are adequate although production has been cut in half for nearly three months. Granite City Steel Co. will complete relining of one of its two blast furnaces by late July.

Tool Steel . . .

Tool Steel Prices, Page 164

New York — Shipments of high speed and tool steel (excluding hollow drill steel) increased in March as compared with February, but were down compared with March a year ago, reports the American Iron & Steel Institute. March shipments totaled 8,454 net tons, against 7,431 in February and 10,782 in March, 1953. Shipments in the first quarter this year amounted to 24,002 tons, a decline compared with 30,597 in the like period of last year.

TOOL STEEL SHIPMENTS

(Net tons; excluding hollow drill steel)

	1954 March	1953 March	1954 Year To Date	1953 Year To Date
Class A high speed	1,168	1,966	3,603	5,621
Class B high speed	300	307	801	819
All hot-work steel	908	1,204	2,769	3,620
High chromium ..	739	787	2,051	2,406
Other alloy tool steels	4,154	4,839	11,350	13,759
Carbon tool steels	1,305	1,679	3,722	4,732
Net Total	8,454	10,782	24,002	30,597

Building Steel Bulks Large

New York—Construction and contractors' products more than ever are a mainstay of the steel industry, says the American Iron & Steel Institute.

These groups received about as much steel, 3 million tons, in first quarter this year as in the same period last year. Their percentage of total shipments was higher than at any time since 1940. They took 20 per cent of direct shipments of finished steel in March this year, in February 19.3, and last year 17.1.

When shipments are totaled for the 14 years 1940 to 1953 inclusive, the 125.8 million tons received by construction and contractors' products groups, including railroad and oil and gas construction, exceeds the total for any industrial category, being surpassed only by the 144 million tons shipped to the warehouses.

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STEEL FABRICATION-MACHINE SHOP, sales $565,000 year, steel plate, boiler, fabricating and repairing, complete welding equipment, heavy duty machinery, concrete-steel building 15,000 ft., overhead-yard cranes, 5 trucks with portable welding equipment, eastern reputable concern, priced with property. Apple Company, Brokers, 1836 Euclid Avenue, Cleveland, Ohio.

WANTED—INVESTMENT CAPITAL INTERESTED IN ESTABLISHING ELECTRIC-WELD TUBE MILL IN CHICAGO AREA. WRITE BOX 977, STEEL, PENTON BUILDING, CLEVELAND 13, OHIO.

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QUALIFIED BLAST FURNACE SUPERINTENDENT or Assistant on single stack plant. Give experience, education and salary expected. Write in detail. Reply Box 978, STEEL, Penton Building, Cleveland 13, Ohio.

SALESMEN

Western Pennsylvania producer of Cold Rolled Strip Steel desires to contact salesmen with steel background to represent line on commission basis, selling industrial accounts, exclusive territories open in principal cities and states. Give complete details on experience and qualifications and area covered—be specific, information will be held confidential. Write Box 979, STEEL, Penton Building, Cleveland 13, Ohio.

FOREMAN for job fabricating shop in northeastern Ohio, making small and medium size material handling and processing equipment. Must have experience in various alloys, supervision of men, new procedures, cost control. Old established growing firm offers excellent opportunity for advancement. State past experience, history, age, salary desired. Replies strictly confidential. Our men know of this ad. Address Box 974, STEEL, Penton Building, Cleveland 13, Ohio.

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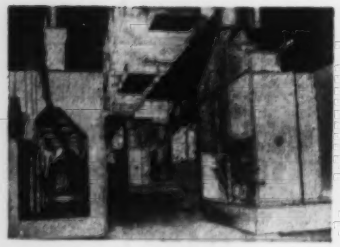

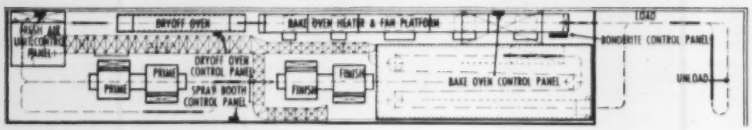

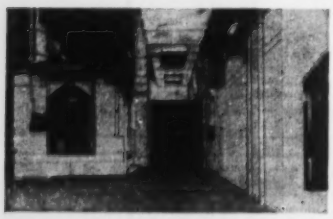

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The rapidly expanding Room Conditioner field requires more manufacturing capacity. To meet these requirements, one manufacturer constructed a new plant in Alabama. When planning the plant layout, utmost consideration was given to installing the best and most efficient equipment. For the complete paint finishing operations, Peters-Dalton, Inc. was chosen. Illustrated here is a small part of this Finishing System—it was designed and installed by P-D engineers.

Space saving was of great importance, and layout for the practical flow and handling of parts and finishing required complete understanding of the manufacturer's needs. These were solved by P-D engineers. The system they installed is now functioning smoothly . . . and efficiently handling production requirements at minimum cost.

Hydro-Whirl Paint Spray Booths · Industrial Washing Equipment
Drying and Baking Ovens · Hydro-Whirl Dust Collecting Systems

Peters-Dalton INC.
17892 Ryan Road • Detroit 12, Michigan

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RED CIRCLE Rolls ALLOY-CHILLED

Rolling Mill Equipment

Outstanding in quality and in performance Hyde Park Rolling Mill Equipment has enjoyed the respect of the industry for more than fifty years.

Bar Mills
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Sheet and Strip Mills
Pinion Stands
Roller Tables
Reduction Drives
Stretcher Levellers
Guillotine Shears
Sheet Mill Shears
Roll Lathes
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Hyde Park
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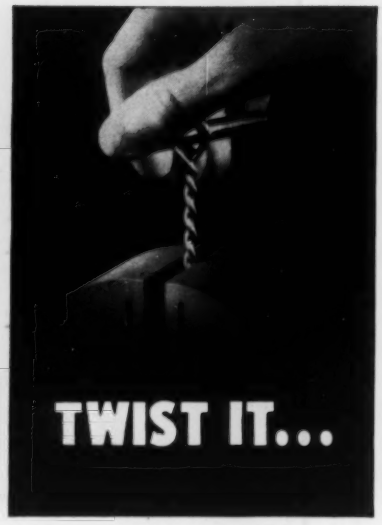


What makes it hold so tight?

The ductile coating of zinc on bethanized wire is undamaged, even when the wire is wrapped around its own diameter.

Bend a piece of bethanized wire, twist it, wrap it around its own diameter—even draw it to fine gauge—and the zinc coating stays put, without cracking, flaking or peeling off.

What makes the bethanized zinc coating hold to the steel wire so tenaciously? The unique electrolytic bethanizing process deposits virgin zinc on an electrolytically cleaned steel surface. The result is a zinc coating of high purity and exceptional ductility. It's integrally bonded to the steel base, proving that it is not necessary to have an iron-zinc alloy layer as a bonding agent.

Besides withstanding severe forming or fabricating operations, bethanized coatings are available in weights to fit your particular requirements. For example, we can supply a coating thickness much heavier than conventional galvanized coatings.

The two great advantages of the bethanized coating—its ability to withstand severe forming and fight off corrosion—make bethanized the ideal zinc-coated wire for many uses. Perhaps it may be the answer to one of your problems. A letter or phone call to the nearest Bethlehem sales office will bring you full information promptly.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHANIZED WIRE

● Cutaway of a large Cleveland double reduction unit which affords a high reduction ratio in limited space. Left: Assembly floor in the main Cleveland plant.

Why CLEVELAND manufactures only worm gear drives

AS EVERY machine designer knows, the right-angle construction of a worm gear drive saves space. Experience demonstrates that soundly engineered worm gearing is a highly efficient drive. And finally, perfectly matched case-hardened steel worms and nickel-bronze gears form rugged units that can outlast the machines they drive.

By devoting its entire engineering and production talent for 42 years to worm gearing alone, the Cleveland Worm and Gear Company has been able to put out the best product of its kind. As a result of this concentration, backed by top-notch performance of its products, *Cleveland leads in the manufacture of worm gearing.*

There are, of course, drive applications where worm gearing is out of place and uneconomical. Our engineers will advise you frankly. But we urge you to look into Clevelands whenever you contemplate installing a speed reducer. Free Catalog 400 will give you full engineering data and our sales representatives are ready to advise you.

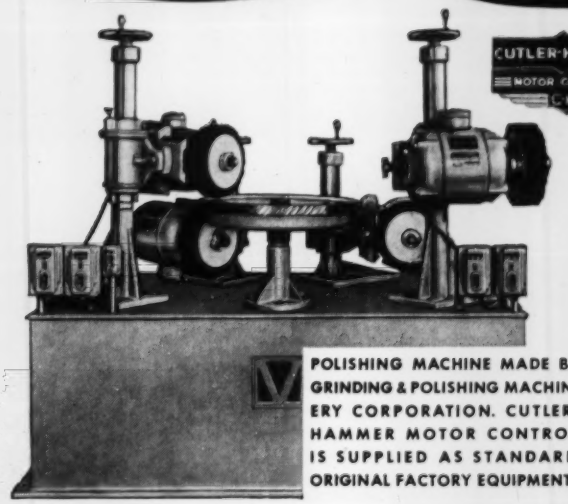
The Cleveland Worm and Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

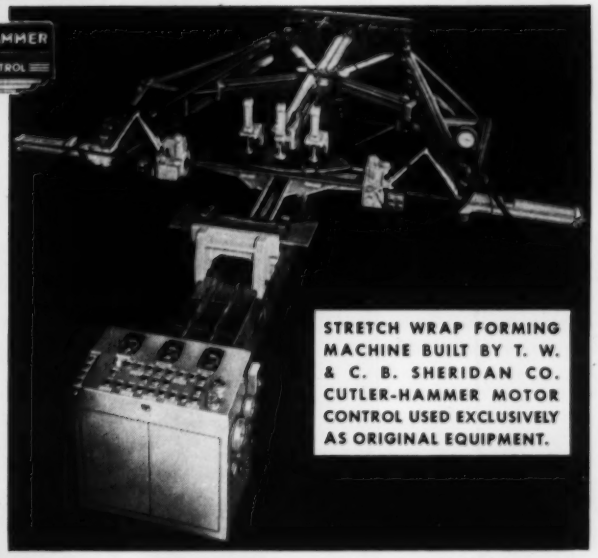
Choice of the Leaders

CUTLER-HAMMER
MOTOR CONTROL
C-H

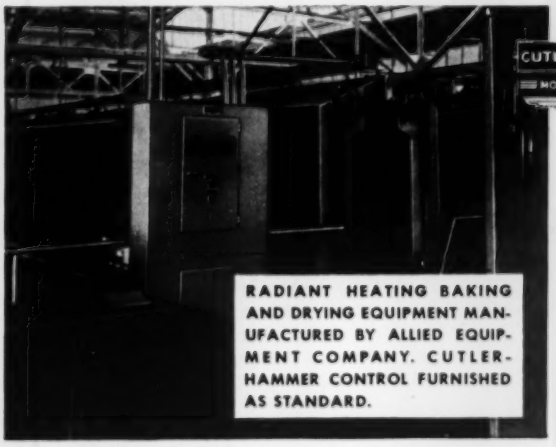
The Mark of Better Machines



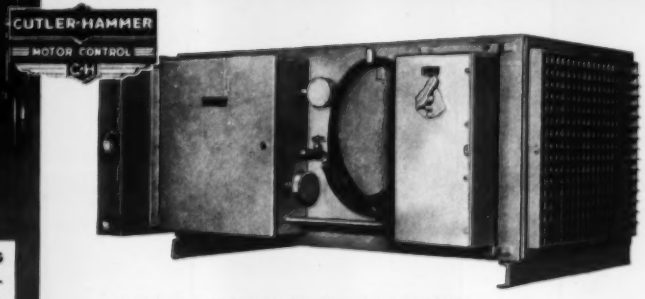
POLISHING MACHINE MADE BY GRINDING & POLISHING MACHINERY CORPORATION. CUTLER-HAMMER MOTOR CONTROL IS SUPPLIED AS STANDARD ORIGINAL FACTORY EQUIPMENT.



STRETCH WRAP FORMING MACHINE BUILT BY T. W. & C. B. SHERIDAN CO. CUTLER-HAMMER MOTOR CONTROL USED EXCLUSIVELY AS ORIGINAL EQUIPMENT.



RADIANT HEATING BAKING AND DRYING EQUIPMENT MANUFACTURED BY ALLIED EQUIPMENT COMPANY. CUTLER-HAMMER CONTROL FURNISHED AS STANDARD.



BAHNSON INDUSTRIAL AIR-CONDITIONER MADE BY THE BAHNSON COMPANY AND FURNISHED WITH CUTLER-HAMMER MOTOR CONTROL AS ORIGINAL EQUIPMENT.

Best by Test

In every division of industry, there are a few companies whose products are widely recognized as superior; by the test of direct competitive comparison these products consistently demonstrate a superiority of performance that sets them apart from all the rest. Such enviable position of leadership can be no accident but must result from a company policy of unrelenting product improvement and a jealous concern for every detail that influences the performance of the product in the field. Since these facts are so clear, what interpretation can be made of the fact Cutler-Hammer Motor Control is so frequently and continuously the choice of the nation's leading machinery manufacturers? Cutler-Hammer Motor Control *must* be a profitable choice for *you*. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin, *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.